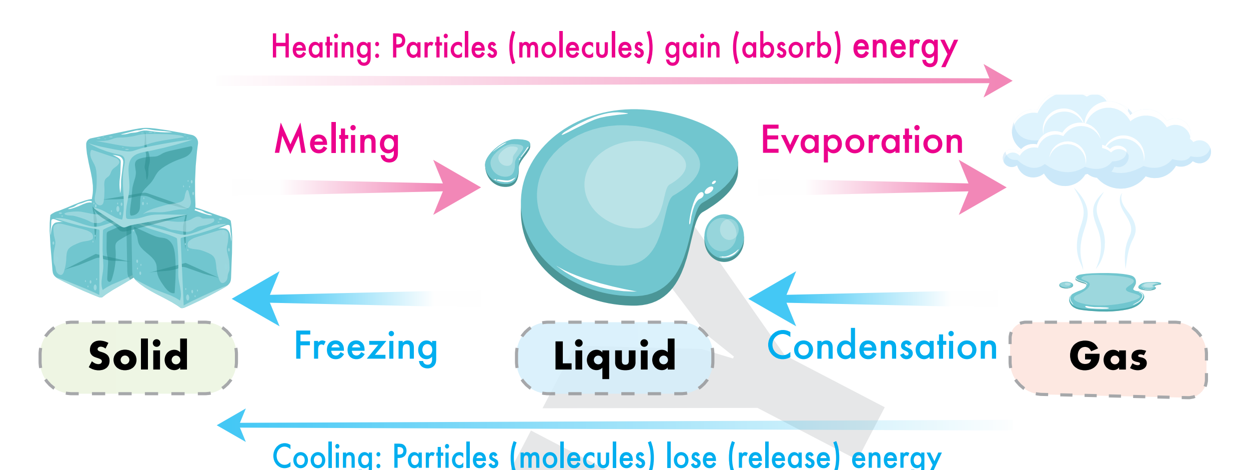
Summary

- Water on Earth exists in three states:
  1. Solid (ice)
  2. Liquid (water)
  3. Gaseous (water vapor)



- Water changes from one state to another when it gains or loses energy.

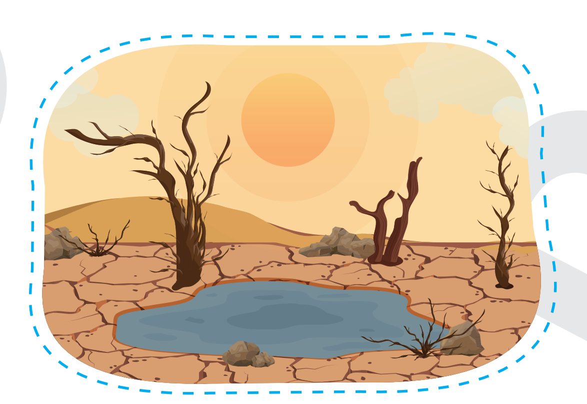


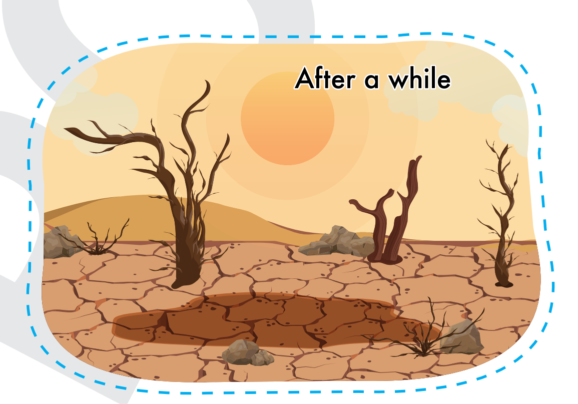
- Melting and evaporation are processes that occur when particles gain (absorb) thermal energy.

- Condensation and freezing are processes that occur when particles lose (release) thermal energy.

Water levels in lakes:

- Water levels in lakes rise (increase) due to the precipitation process.
- Water levels in lakes drop (decrease) due to the evaporation process.

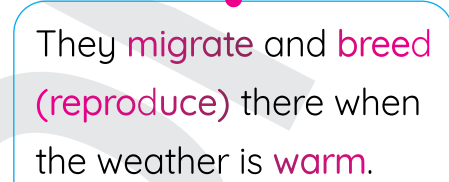




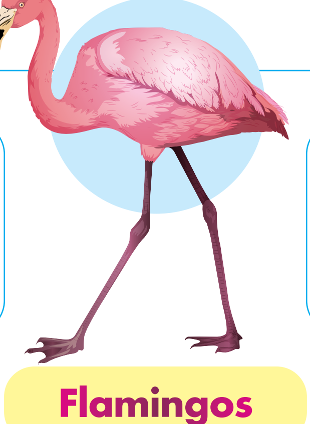
- The water levels in lakes rise and drop due to the energy transfer during the water cycle.
- Scientists try to find ways to conserve ecosystems from climate change.

Example:

- There was a large salt lake in Turkey that had hosted huge colonies of flamingos.
- Over time, it turned into a puddle, then it dried up completely in the summer.



They migrate and breed (reproduce) there when the weather is warm.



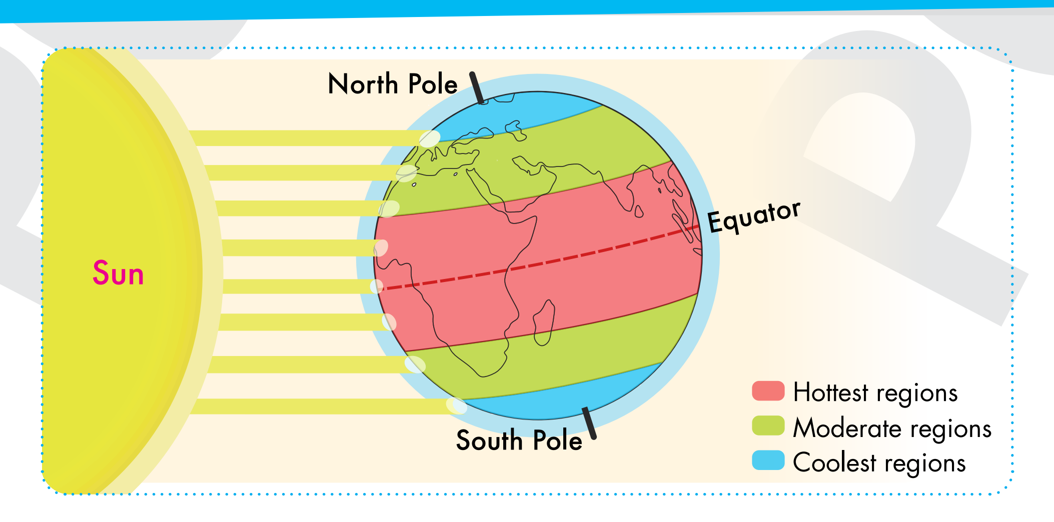
They feed on the algae in the lake's shallow waters.

Flamingos

Solar Energy Distribution

- The amount of solar radiation that reaches any area on the Earth's surface in different areas is unequal.

The following figure shows the distribution of solar energy on the Earth



We can divide the Earth into three different climatic zones:

Region	Hottest Regions	Moderate Regions	Coolest Regions
Location	They are close to the equator	They are located between the hottest and coldest regions.	They are regions near the North or South pole of the Earth.
Weather	Hot and wet (humid)	Warm	Very cold
The Rate of Evaporation	Highest	Moderate	Lowest
Sunrays	Perpendicular and focused on small area	Semi-slanted (semi-inclined) and focused on larger area.	Very slanted (very inclined) and focused on much greater area.

Unit 3

Water Cycle

- There is no start point or end point for the water cycle.
- Even in a dry desert, the water cycle takes place.
- The two basic factors that drive the water cycle are the solar energy and gravity force.



First: Important Definitions:

Water Cycle	It is the movement of water among the various reservoirs.
Reservoir	It's the storage location of water on Earth such as: • Oceans • Seas • Rivers • Lakes • Glaciers • Groundwater • Soil • Rocks • Living organism

Water cycle consists of three main processes and two steps:

1 **Evaporation:**	A process in which water changes from a liquid state into a gaseous state.
2 **Condensation:**	A process in which water changes from a gaseous state into a liquid state.
3 **Precipitation:**	A process in which water falls on the Earth's surface in the form of rain, sleet, hail, or snow
4 **Runoff:**	A step in which water flows along the Earth's surface into streams or rivers, then into the sea or the ocean.
5 **Collection:**	A step in which the water of rain is collected in different bodies of water.

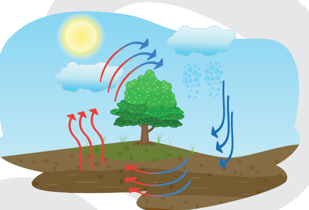
Second: Factors that affect the water cycle:

Sun:

Sun provides the energy needed to:

- melt ice into water.
- evaporate water into water vapor.
- generate wind.



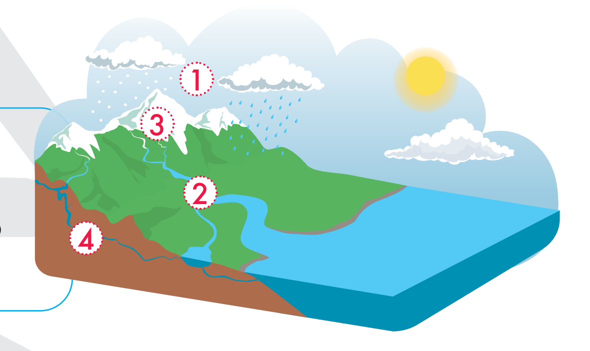


Wind:

- Wind moves water vapor from place to another.
- Wind causes ocean currents that transport water to different locations on Earth.



Gravity:



1. Gravity pulls water droplets and ice crystals in clouds down to fall back to Earth's surface.

2. Gravity pulls liquid water to flow downhill in streams and rivers toward larger water bodies.

3. Gravity pulls glaciers from higher elevation to lower elevation.

4. Gravity also causes liquid water to leakage down into the ground to the groundwater reservoir.

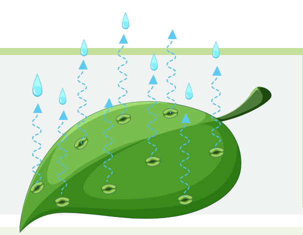
Third: Steps of the water cycle:



- Sun heats liquid water of oceans, seas, lakes, and rivers to change it to water vapor.
- Plants give off water vapor through transpiration.

Transpiration

The process of releasing water vapor into the air through tiny pores on the leaves called stomata.



- Transpiration is a form of evaporation.
- About 10 % of the water vapor in the air comes from transpiration.
- You can observe transpiration when a plant set in the sun with a plastic bag tied around the leaves.
- The rate of transpiration increases by increasing solar radiation.



- Water vapor in moist air is cooled and condensed forming water droplets.
- Water droplets stick on the particles of dust, pollens and smoke in air.
- Millions of tiny water droplets are collected together forming cloud.

Examples of Condensation:

- Formation of fogs and clouds
- Formation of water droplets on the glass cup contains cold water.



- When water droplets in clouds become too heavy, Gravity will pull water droplets down in the form of precipitation.



- When precipitation hits Earth in the form of rain, snow, sleet, or hail, it may flow across the land as runoff.



- Runoff is collected in streams, rivers, lakes, or oceans.
- Eventually, water evaporates and starts the water cycle all over again.

Convection Current

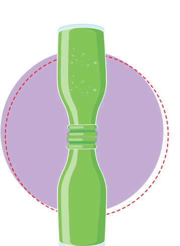
First: Ways of heat transfer:

- Heat transfers through solids by conduction.
- Heat transfers through fluids (liquid and gases) by convection.
- Heat transfers from the sun through the space by radiation.

Second: Experiment:

What happens when:

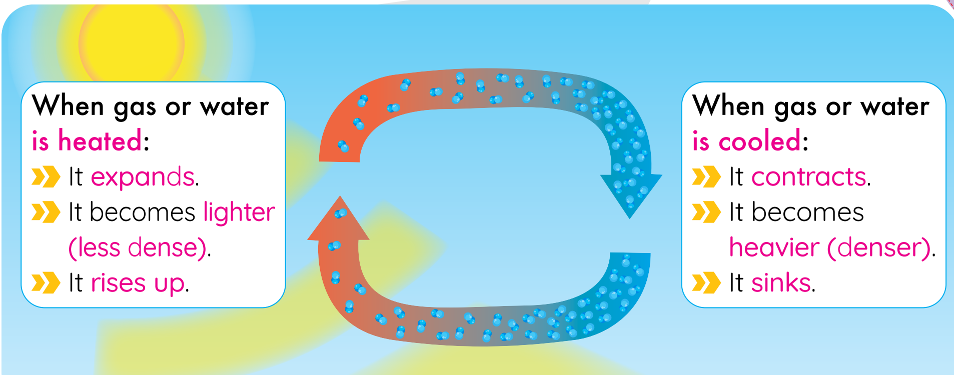
1 You place the blue cold water on yellow hot water.



- The two colors will mix together forming green color.

2 You place the water on blue cold water.

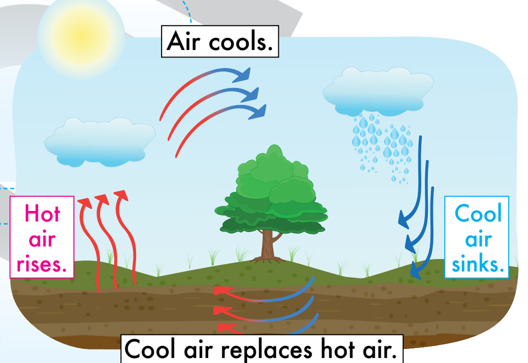
- The two colors will not mix together.





Third: Convection current in nature:

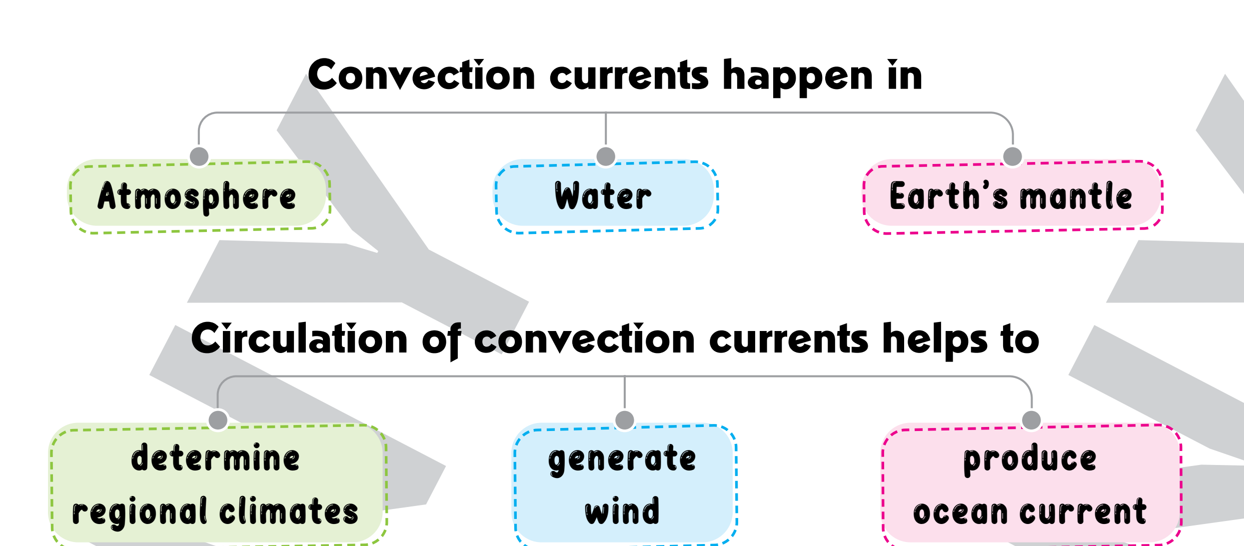
As warm, moist air rises,
Water vapor in the air cools and condenses into water droplets to form clouds.



As warm air is replaced by cold air,
This process causes wind.

The rising warm air loses water in the form of rain.
The descending cold air becomes dry when it reaches Earth's surface.

When the dry air flows on Earth, it forms a group of deserts.



- Earth has a global wind system that consists of winds that blow in a constant direction over long periods of time.
- The wind direction is determined by two factors:
  1. The unequal solar radiation at different latitudes.
  2. The rotation of Earth.

General Exercises on Concept 3.1

1 Choose the correct answer:

1. A puddle may dry up due to the .... process.
   a. condensation b. precipitation c. evaporation d. melting
2. All the following processes are involved in the water cycle, except ....
   a. condensation b. transpiration
   c. precipitation d. photosynthesis
3. .... is a form of evaporation that takes place in the plant's leaves.
   a. Photosynthesis b. Transpiration c. Precipitation d. Respiration
4. .... return(s) water to the air in the form of water vapor.
   a. Transpiration b. Evaporation c. Condensation d. a and b
5. Which of the following is NOT a result of condensation?
   a. Clouds b. Water vapor c. Fog d. a and c
6. The snow falling in a polar region represents the .... process.
   a. condensation b. precipitation c. evaporation d. melting
7. The water in a river traveling down a mountainside into the sea represents ....
   a. transpiration b. precipitation c. runoff d. evaporation
8. .... is the main source of energy that drives the water cycle.
   a. The moon b. Gravity c. The Sun d. Earth
9. When the water in clouds becomes too heavy, it falls on the Earth's surface by a process called ....
   a. condensation b. precipitation c. evaporation d. melting
10. All the following are examples of water reservoirs on the Earth, except ....
    a. atmosphere b. glaciers c. space d. soil

11 The .... process follows the evaporation process in the water cycle.

a. precipitation b. transpiration c. condensation d. melting

12 Groundwater flowing from areas of higher elevations to lower elevations due to the action of ....

a. gravity b. wind c. Sun d. energy

13 Evaporation of the liquid water needs .... to form water vapor .

a. gravity b. wind c. force d. energy

14 All the following are forms of precipitation, except ....

a. snow b. rain c. water vapor d. hail

15 .... and .... processes release energy.

a. Evaporation – condensation b. Freezing – condensation
c. Melting – transpiration d. Transpiration – evaporation

16 .... and .... processes are the reason that water vapor exists in the air.

a. Transpiration - condensation b. Evaporation - precipitation
c. Precipitation - condensation d. Evaporation - transpiration

17 The climate near the equator is ....

a. hot and dry b. hot and wet c. cold and wet d. cold and dry

18 Heat transfers by convection currents in ....

a. space b. metals c. fluids d. solids

19 Heat is transferred from the Sun through space by ....

a. conduction b. convection c. radiation d. b and c

20 When the air particles gain energy, they become .... dense and ....

a. more - sink b. less - sink c. more - rise d. less - rise

21 When air is heated by solar radiation, it will move ....

a. upward b. downward c. forward d. backward

22 The .... air forms a group of deserts around the Earth.

a. moist b. humid c. dry d. wet

2 Put (✓) or (✗):

1. The state of water changes when water gains or loses energy. ( )
2. Flamingos prefer to breed when the weather is cold. ( )
3. In the water cycle, the step that follows the precipitation process is collection. ( )
4. The water level in lakes decreases due to the precipitation process. ( )
5. The water level in the lake is not affected by any change in temperature. ( )
6. As we move away from the equator, the climate becomes warmer. ( )
7. The regions near the two poles have moderate temperatures. ( )
8. The amount of solar radiation that reaches the Earth is equal. ( )
9. The water cycle occurs in a dry desert environment. ( )
10. Falling of sleet in an area is an example of precipitation. ( )
11. Transpiration in plants contributes to the water cycle. ( )
12. The human body is considered a water reservoir. ( )
13. Melting and condensation processes only occur by cooling. ( )
14. Clouds are made up of millions of tiny water droplets. ( )
15. When water vapor rises up in the sky, it forms clouds. ( )
16. Water vapor is invisible, so we can't see it in the atmosphere. ( )
17. 10% of the water vapor in the air comes from green plants. ( )
18. When water droplets in clouds become too heavy, they evaporate. ( )
19. Cold air is always replaced by warm air. ( )
20. Cold water is denser than hot water. ( )
21. When the air is heated, it expands and becomes denser. ( )
22. The heat of the Sun transfers through space by convection. ( )

23 Convection current has an important role in the condensation process. ( )

24 Warm air is less dense than cold air. ( )

25 Warm air always replaces cold air. ( )

26 In convection, both warm and cold particles of a fluid move in the same direction. ( )

27 Deserts are formed by the effect of moist air. ( )

28 As you go away from the equator, sunlight is distributed over a smaller area. ( )

29 Wind is produced with the help of solar radiation. ( )

30 When glaciers are heated, they turn from a liquid state into a solid state. ( )

3 Write the scientific term:

1 It is the movement of water among the different reservoirs. (..................)

2 It is a storage location for water on Earth. (..................)

3 The main source of energy that drives the water cycle. (..................)

4 The force that pulls water droplets down o Earth's surface. (..................)

5 The force that moves water vapor in the air from one place to another. (..................)

6 The process of changing water into water vapor by heating. (..................)

7 The process of changing water vapor into water droplets by cooling. (..................)

8 The process by which glaciers change into liquid water. (..................)

9 The process by which water falls on Earth in the form of rain, sleet, snow or hail. (..................)

10 It is the process by which water on the Earth's surface is collected by different water bodies. (..................)

11 It is the step in which water flows along the Earth's surface into the river. (..........................)

12 It is a form of evaporation that takes place in plant leaves. (..........................)

13 It is the way in which heat transfers within liquids and gases. (..........................)

14 It is the way in which the heat of the Sun transfers through space. (..........................)

15 Circulation that is caused when air warmed by solar radiation rises and then replaced by cooler air that flows from nearby areas. (..........................)

16 Large areas on Earth that are formed due to the effect of dry air. (..........................)

4 Complete the following using the words between the brackets:

A (evaporation - transpiration - condensation – liquid -warm – precipitation)

1 About 10% of the water vapor in air comes from .... of plants.

2 When glaciers gain thermal energy, they change into .... state.

3 The large salt lake in Turkey is dried up due to the increase in the rate of ....

4 Clouds are formed due to .... process then rain falls due to .... process.

B (releases - gravity - force - Atmosphere - Clouds - absorbs - soil)

1 .... and .... are considered water reservoirs.

2 Groundwater flows from higher elevations to lower elevations by the action of ....

3 .... contains millions of tiny water droplets.

4 Water turns into ice when it .... energy, and turns into water vapor when it .... energy.

5 The water starts to move or change its way of movement when a .... affects it.

Unit 3

C (solar - convection - global wind system - rain - density)

1. Earth has a .... in which winds blow in a constant directions.
2. The amount of .... energy that reaches the Earth affects the rate of evaporation process in the water cycle.
3. Cold water has more .... than warm water.
4. Heat can transfer through the Earth's atmosphere due to the .... currents.
5. When warm air contains enough water vapor, it loses this water in the form of ....

5 Cross out the odd word:

1. Evaporation – Filtration – Condensation – Precipitation (..................)
2. Evaporation – Transpiration – Condensation – Melting (..................)
3. Smoke – Dust – Pollens – Rocks (..................)
4. Rain – Snow – Water vapor – Hail (..................)
5. Living organisms – Glaciers – Dust – Atmosphere (..................)
6. North Pole – Hottest regions – Coolest regions – South Pole (..................)

6 Choose from column (A) what suits it in column (B):

A

Column (A)	Column (B)
1 Solar radiation	a. is formed due to condensation process.
2 Gravity	b. pulls groundwater from high elevation to low elevation.
3 Wind	c. is an example of reservoir.
4 Cloud	d. is the source of energy that drives the water cycle.
5 Atmosphere	e. moves water vapor from place to another.

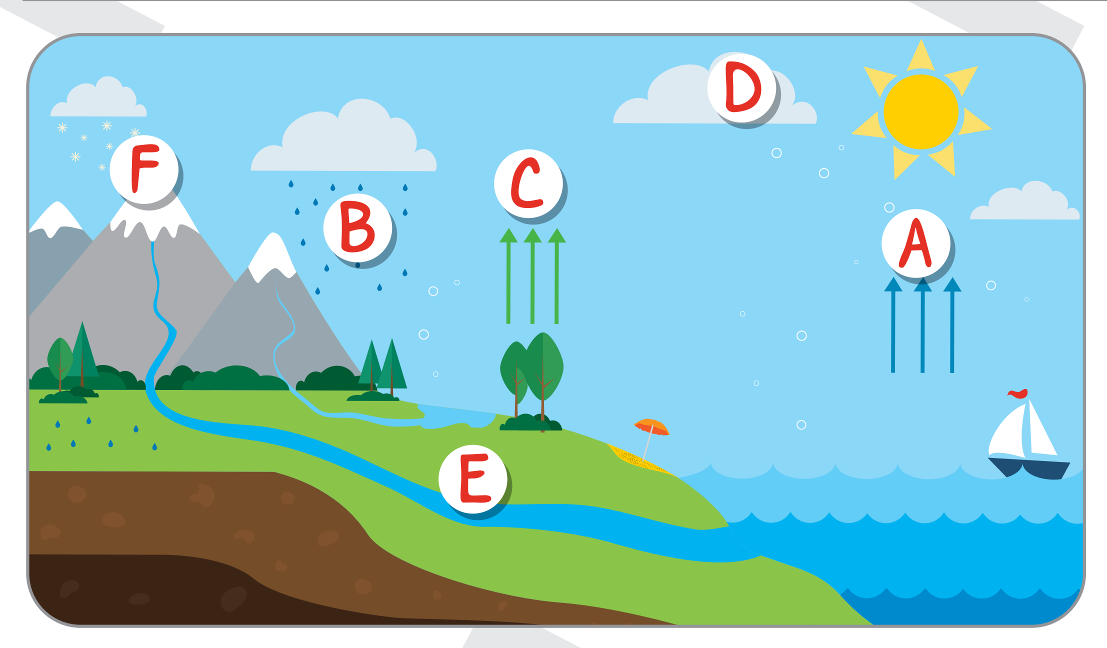
1 .... 2 .... 3 .... 4 .... 5 ....

B

Column (A) Weather is	Column (B) when sunrays fall ....
1 hot and humid	a. very slanted on a much greater area.
2 warm	b. perpendicular on small area.
3 very cold	c. slanted on a greater area.

1 .... 2 .... 3 ....

7 Study the following figure, then complete the following sentences:



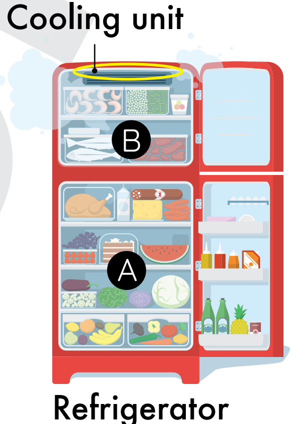
1. Letter (..........) represents the runoff.
2. Letter (..........) represents the precipitation process.
3. Letter (..........) represents the transpiration process.
4. Letter (..........) is the opposite process of condensation.
5. Letter (..........) is formed due to condensation.
6. When part (..........) gains energy, it changed into liquid water .

8 Study the following figure, then put (✓) or (✗):

1. The air in area (B) is cooled and descends as it becomes denser. ( )
2. The air in area (A) replaces the air in area (B). ( )



3. Heat transfer inside the refrigerator by radiation. ( )
4. If we put the cooling unit at the bottom of the refrigerator, heat won't transfer ( )



9 Study the following figure, then put (✓) or (✗):

1. Region (A) has the highest rate of evaporation. ( )
2. Region (B) has a warmer climate than region (C). ( )
3. The sunrays fall very slanted on region (A). ( )
4. The sunrays have different impacts on the three regions. ( )

10 What happens if:

1. A moist air when touches a cold glass of water?

....

....

2. The Sun heats the water of ocean?

....

....

3. The water droplets in the clouds become very heavy?

....

....

4. Precipitation hits the Earth's surface?

....

....

5. The dry air flows on the same place for a long time?

....

....

6. There is no wind on Earth?

....

....

11 Give reasons for:

1. The water levels in some lakes may rise.

....

....

2. The water levels in some lakes may drop.

....

....

3. Fog may form over a field in the early morning.

....

....

4. Moving groundwater from high elevation to low elevation.

....

....

5. The Sun is the main source of energy that drives the water cycle.

....

....

6. The rate of evaporation is lowest in regions near the poles.

....

....

Answers
Concept 3.1

1
1 c 2 d 3 b 4 d 5 b
6 b 7 c 8 c 9 b 10 c
11 c 12 a 13 d 14 c 15 b
16 d 17 b 18 c 19 c 20 d
21 a 22 c

2
1 ✓ 2 ✗ 3 ✗ 4 ✗ 5 ✗
6 ✗ 7 ✗ 8 ✗ 9 ✓ 10 ✓
11 ✓ 12 ✓ 13 ✗ 14 ✓ 15 ✓
16 ✓ 17 ✓ 18 ✗ 19 ✗ 20 ✓
21 ✗ 22 ✗ 23 ✓ 24 ✓ 25 ✗
26 ✗ 27 ✗ 28 ✗ 29 ✓ 30 ✗

3
1 Water cycle 2 Reservoir
3 The sun 4 Gravity force
5 Wind 6 Evaporation
7 Condensation 8 Melting
9 Precipitation 10 Collection
11 Runoff 12 Transpiration
13 Convection 14 Radiation
15 Convection currents
16 Deserts

4
(A) 1 transpiration 2 liquid
3 evaporation
4 condensation - precipitation
(B) 1 Atmosphere - soil
2 gravity 3 Clouds
4 releases - absorbs
5 force
(C) 1 global wind system
2 solar 3 density
4 convection 5 rain

5
1 Filtration 2 Condensation
3 Rocks 4 water vapor
5 Dust 6 Hottest regions

6
(A) 1 d 2 b 3 e 4 a 5 c
(B) 1 b 2 c 3 a

7
1 (E) 2 (B) 3 (C) 4 (A)
5 (D) 6 (F)

8
1 ✓ 2 ✗ 3 ✗ 4 ✓

9
1 ✓ 2 ✓ 3 ✗ 4 ✓

10
1 Water droplets will form on the cold glass of water.
2 Water will evaporate and rise in the sky.
3 Gravity will pull water droplets down in the form of precipitation.
4 Water will flow across the land as runoff.
5 A group of deserts will be formed.
6 Some ecosystems will disappear or change completely.

11
1 Due to the precipitation process.
2 Due to the evaporation process.
3 Due to the condensation process.
4 Due to the action of gravity force.
5 Because Sun provides the energy needed to melt ice into water or to evaporate water into water vapor.
6 Because sunrays falls very slanted and focused on much greater area.

Summary

Meteorologists

They are scientists who use different tools to study and forecast the weather.



Meteorology

It is the science of studying and predicting the weather.

Meteorologists predict weather through three stages:

Gathering Data → Analyzing Data → Put It all Together

1 Collecting (Gathering) Data:

- Meteorologists collect as much data as they can about weather. G.R
  To ensure that they have a complete understanding of the weather.
- Meteorologists collect data through wide areas, different altitudes. G.R
  To understand how weather is changing and to predict future weather.

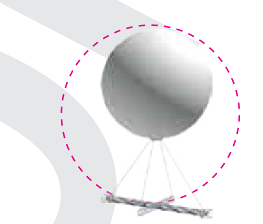
(A) Measurement Tools:

Thermometer	Measures the air temperature.	
Barometer	Measures the air pressure.	
Anemometer	Measures the wind speed.	
Rain Gauge	It can record how much precipitation is falling in an area.	
Weather Radar	It detects precipitation and tracks thunderstorms and hurricanes.	

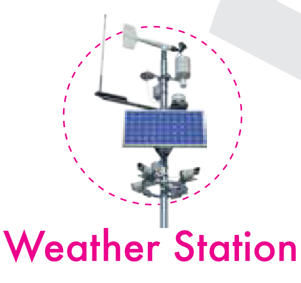
(B) Carrying Measurement tools:


Airplanes


Satellites


Weather Balloons

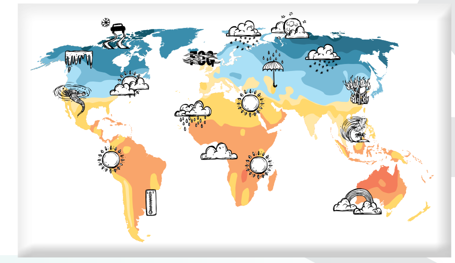
(C) Transmitting data tools:


Weather Station


Satellite

2 Analyzing Data:

- One of the most useful ways to analyze data is mapping data.
- Mapping data helps meteorologists to:
  1. identify weather patterns and air movement.
  2. communicate information to meteorologists and the public.



3 Putting It all Together:

- Meteorologists apply what they know about how other factors, such as landforms, affect weather.
- Meteorologists use complex computer models to predict how different factors will interact.
- Weather forecasts can be uncertain for the next days or weeks.
- Some unexpected changes in weather patterns may happen.

Atmospheric Pressure

It is the weight of the air column above a location.

Or

It is the force that air exerts on its surroundings.



Humidity

It is the measure of how much water vapor is present in the air.

Changes in the Atmosphere

- The properties of the atmosphere are different at the top and the bottom of a mountain.

As the elevation from the sea level increases, all the following decrease:

1. Temperature
2. Atmospheric pressure
3. Air density

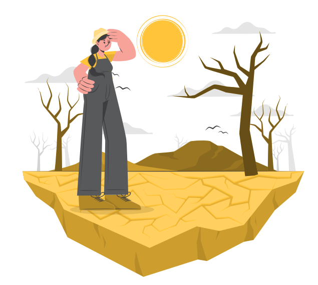
At the top of a mountain, there is:
- Low atmospheric pressure
- Low temperature
- Low air density

At the bottom of a mountain, there is:
- High atmospheric pressure
- High temperature
- High air density

Desert:

Climate:	hot and dry or arid
Rainfall:	• It has the least amount of rain compared to other biomes. • Deserts receive about 250 millimeters of rain per year.



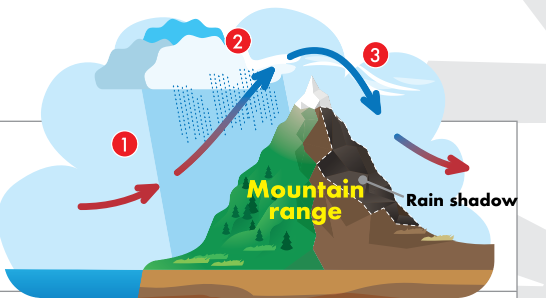


» Farming is difficult in the desert biome.
Because more water evaporates than water that falls by precipitation.

» Farmers use innovative ways to make the soil fertile and fruitful, such as:

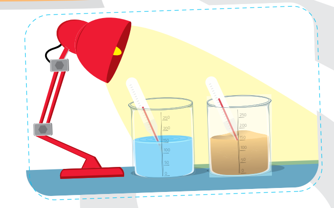
Water	Soil	Crops	Energy
They irrigate crops by reusing water.	They improve soil quality.	They grow crops that are able to withstand the heat and low-fertility soil.	They use solar energy or wind turbines to power the farm.

Rain shadow:



Definition:	An area on the dry side of a mountain range where rainfall is reduced.
How does it form?	It is formed when mountains block the humid air.
Steps of formation:	1. When humid air faces a mountain range, it rises. 2. The humid air cools, so water vapor condenses, then precipitates. 3. The air becomes dry and descends on the other side to form an area called a rain shadow.

Experiment 1: The Unequal Heating of Earth



- The solar radiation has a different effect on water and land on the Earth's surface.
- Sand heats up and cools faster than water.

	Day Temperature	Night Temperature
Coastal Regions	Moderate temperature (because water heats up slowly)	Moderate temperature (because water cools slowly)
Desert Regions	High temperature (because sand heats up quickly)	Low temperature (because sand cools quickly)

Experiment 2: Spinning paper spiral



What happens if?

1 You hold the paper spiral over the lighted lamp.

- The paper spiral begins to spin without stopping.

Reason:

- The warm air around the paper spiral expands and becomes less dense. So, it moves up, allowing the cooler and denser particles to move downward.

2 You sprinkle talcum powder over the hot, lighted lamp.

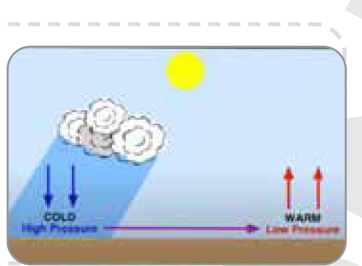
- The powder rises above the lighted lamp.

3 You sprinkle talcum powder over the turned of the lamp.

- The powder spreads and interferes with cooler air.

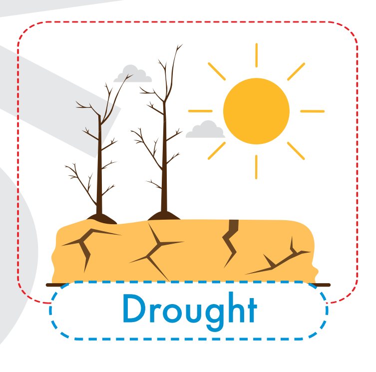


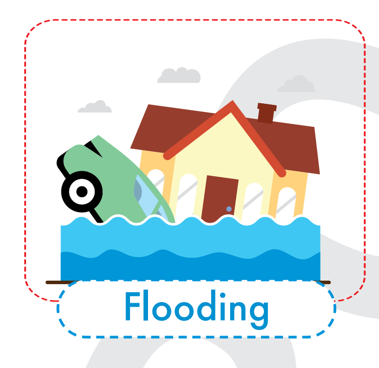
- The vertical movement of air is called the air current.
- The horizontal movement of air is called wind.



Unit 3

Extreme Weather Events:







» In recent years, there is an increase in the extreme weather events due to global climate change.

Extreme precipitation events cause:

- Changing ecosystems.
- Damage to human structures and agricultural systems.
- Injuries and deaths.

1 Drought:	2 Flooding:
Definition	
It is the lack (shortage) of available water in an area.	It is the overflow of water on the land around riverbanks edges.
Reasons:	
• A long period of dry weather. • There is an extended heat wave.	• Rapid increase in rainfall. • The sudden melting of snow and ice over a region.
Harms	
• There is not enough water for growing crops, farming animals, industry, and cities.	• It damages buildings by moving or breaking them. • It leads to the drowning of people and livestock • It can disrupt economies.

Advantages of Floods:

» Some ecosystems depend on periodic flooding, ecosystems along the Nile.



- In general, ecosystems eventually recover from flooding.
- Every few decades, very extreme floods will occur.
- Flooding is worse if the ground is frozen. Because it cannot absorb water.

3 Sandstorms: (Dust storm)

Reason (way of formation)	Sandstorms happen when very strong winds blow up sand or dust from a dry area.
Their Location	1 They are common in deserts. 2 An area that has prolonged drought.
Their Shape	A solid wall of debris and dust traveling along a horizon.
Their Size	They extended several kilometers long and hundreds of meters high, which makes them easy to see.

Harms of Sandstorms:

on Humans	1 They are dangerous to motorists and drivers because they reduce visibility and increase accidents. 2 The dust harms your health if dust is inhaled or blown into your eyes.
on Water	3 Dust fills irrigation canals, affecting water quality.
on Energy	4 Dust builds up on solar panels, and stop generating of energy.
on Airplanes	5 It damages plane engines and stops airplane travel.

General Exercises on Concept 3.2

1 Choose the correct answer:

1. Clouds are formed when .... air is ....
   a. dry - cooled b. humid - heated
   c. dry – heated d. humid - cooled
2. A rain shadow is an area that is formed behind a ....
   a. forest b. mountain c. sea d. building
3. If the temperature at the top of a mountain is 18°C, so the temperature at its bottom might be ....
   a. 18°C b. 0°C c. 10°C d. 25°C
4. A .... is formed when a mountain range blocks the ....
   a. sandstorm - dry air b. sandstorm - humid air
   c. rain shadow - humid air d. rain shadow - dry air
5. All the following are innovative ways that are used by farmers in the desert, except ....
   a. reusing water b. using wind turbines
   c. building dams d. using solar energy
6. The .... biome receives the least amount of rainfall per year.
   a. tropical rainforest b. grassland
   c. temperate forest d. desert
7. Meteorologists are scientists who study ....
   a. rocks b. weather c. water d. plants
8. The desert biome has all the following properties, except ....
   a. little rainfall b. extreme climate
   c. arid conditions d. moderate climate
9. The temperature may reach more than 30 degrees in Aswan tomorrow. This reflects the ....
   a. humidity b. air pressure c. weather d. climate

10 Putting data on a weather map represents .... in weather prediction.
a. gathering data
b. collecting data
c. analyzing data
d. putting all together

11 Applying what meteorologists know about the effects of different landforms on weather is called ....
a. mapping data
b. analyzing data
c. collecting data
d. putting all together

12 Meteorologists use .... to measure the air temperature.
a. barometers
b. thermometers
c. satellites
d. anemometers

13 A/An .... is used to measure the current atmospheric pressure.
a. barometer
b. thermometer
c. satellite
d. anemometer

14 .... are used to measure the speed of tornado's winds.
a. Satellites
b. Thermometers
c. Radars
d. Anemometers

15 .... is the measure of the amount of water vapor in the air.
a. Precipitation
b. Humidity
c. Temperature
d. Atmospheric pressure

16 .... is the weight of the air column above a specific area.
a. Temperature
b. Gravity
c. Temperature
d. Atmospheric pressure

17 A/An .... can be used to compare the amount of precipitation in two different regions.
a. barometer
b. weather radar
c. raingauge
d. anemometer

18 A .... can carry weather measurement tools and also transmit weather data.
a. barometer
b. weather station
c. thermometer
d. satellite

19 The horizontal movement of air along the Earth's surface is called ....
a. air currents
b. atmosphere
c. wind
d. air pressure

20 .... pulls heavy water droplets in clouds downward.

a. Humidity b. Gravity c. Wind d. Sunlight

21 The formation of ice crystals occurs when the air in clouds becomes .... enough.

a. warm b. light c. cold d. hot

22 All the following are extreme weather events, except ....

a. drought b. precipitation c. flooding d. sandstorm

23 A .... looks like a solid wall of debris and dust traveling along the horizon.

a. flood b. sandstorm c. drought d. tsunami

24 The sudden melting of snow and ice over a region causes ....

a. earthquakes b. drought c. hurricanes d. floods

25 Sandstorms are most common in ....

a. polar regions b. deserts

c. rainforests d. green landscapes

26 .... may cause the drowning of people and livestock.

a. Sandstorm b. Drought c. Flooding d. Wildfire

2 Put (✓) or (✗):

1 Meteorologists can be completely sure of future weather. ( )

2 Clear sky can turn cloudy and rainy throughout the day. ( )

3 The density of cold air is less than that of hot air. ( )

4 Desert is characterized by hot and rainy climate. ( )

5 During climbing a mountain, the reading of barometer increases. ( )

6 Wind turbines can be used to operate desert farms. ( )

7 By increasing the temperature of the air, its density increases. ( )

8 Wind is created when less dense air replaces more dense air. ( )

9 When warm-moist air rises, it forms clouds. ( )

10 The solar radiation has a different effect on water and land on the Earth's surface. ( )

11 The sand absorbs heat slower than water during daytime. ( )

12 Water and sand on beach usually have the same temperature. ( )

13 Meteorologists collect data about weather conditions after analyzing them. ( )

14 Rain gauge can be used to predict precipitation for coming days.( )

15 Anemometer can be used to track thunderstorms and hurricanes. ( )

16 A tornado's wind direction is measured by an anemometer. ( )

17 A frozen ground can absorb the water when flooding occurs. ( )

18 In general, ecosystems can recover from flooding. ( )

19 Drought and flooding have no harmful effects. ( )

20 Flooding has some benefits. ( )

3 Write the scientific term:

1 They are scientists who study and forecast the weather. (..........)

2 It is the science that studies the weather conditions. (..........)

3 It is an area on the dry side of a mountain range where rainfall is reduced. (..........)

4 It is a side of mountain ranges that faces the humid air. (..........)

5 It is a side of mountain ranges where the rain shadow is formed. (..........)

6 It is the weight of the air column above an area. (..........)

7 It is the amount of water vapor in the air. (..........)

8 It is the biome that has the least amount of rainfall on the Earth. (..........)

9 It is a device that used to measure the atmospheric pressure. (..................)

10 It is a device that used to measure the air temperature. (..................)

11 It is a device that used to measure the wind speed. (..................)

12 It is a device that used to measure the amount of precipitation. (..................)

13 It is a device that used to predict thunderstorms and hurricanes. (..................)

14 It is the horizontal movement of the air on the Earth's surface. (..................)

15 It is the vertical movement of air on Earth's surface. (..................)

16 It is the first stage in the weather prediction process. (..................)

17 It is the final stage in the weather prediction process. (..................)

18 It is lack of available water for growing crops or farming animals. (..................)

19 It is the overflow of water on the land around riverbanks due to the increase in rainfall flowing on the river. (..................)

20 It is a solid wall of debris and dust traveling along the horizon. (..................)

4 Complete the following using the words between the brackets:

A (horizontally - rain shadow - dry - increases - humid - vertically - decreases)

1 During climbing a mountain, atmospheric pressure ...., while air density .... when we go down.

2 A .... is formed when a mountain range blocks the .... air coming from a nearby ocean.

3 Desert biome has .... climate.

4 Air currents move ...., while wind moves .... on Earth.

B (shorter - Landforms - weather radar - rain gauge - Ice crystals - Clouds – longer)

1. At noon, water gets hot in a .... time than sand.
2. A rainfall can be predicted by a ...., while the amount of rainfall can be measured by a ....
3. .... are from the factors that affect the weather.
4. .... are formed when water vapor in the air is condensed.
5. .... are formed when the air in the cloud is cold enough.

C (Sandstorm - visibility - flooding - water quality - solar panels)

1. Dust storms may affect the .... in irrigation canals or build up on .... that stops generating energy.
2. Sudden melting of snow in an area may cause ....
3. .... may damage plane engines and stop airplane travel.
4. Sandstorms can reduce .... for motorists, which increase road accidents.

5 Choose from column (A) what suits it in column (B):

A

Column (A)	Column (B)
1 Wind turbines	a. the atmospheric pressure is low.
2 At the top of a mountain	b. is formed on dry side of a mountain.
3 At the bottom of a mountain	c. the air density is high.
4 Rain shadow	d. are used to power farms in deserts.

1 .... 2 .... 3 .... 4 ....

B

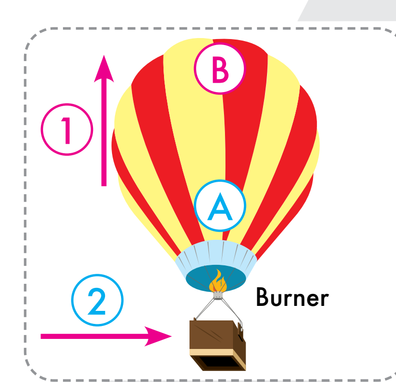
Column (A)	Column (B)
1 Heavy rain on river may cause	a. sandstorm
2 Extreme hot temperatures may cause	b. drought
3 Strong wind in desert may cause	c. flooding

1 .... 2 .... 3 ....

6 Cross out the odd word

1. Less rainfall – Dry climate – More precipitation – Arid conditions (..................)
2. Temperature – Atmospheric pressure – Barometer – Humidity (..................)
3. Thermometer – Barometer – Anemometer – Temperature (..................)
4. Satellites – Weather balloons – Thermometer – Airplane (..................)
5. Sandstorm – Precipitation – Flood – Drought (..................)

7 Study the following figure, then choose the correct answer:



1. The air in .... is warmer.
   (area A – area B)
2. When the air in area (A) heats up, it ....
   (sinks – rises)
3. When the air in area (B) cools, it becomes .... dense, so it ....
   (more, sinks – more, rises – less, sinks)
4. The arrow number .... represents the movement of the wind.
   (1 – 2)

8 Study the following figure, then choose the correct answer:

1. Area .... heats up faster. (A - B)
2. If the temperature of area (A) during the day is 30°C, then the temperature in area (B) might be ....°C. (30 - 26 - 34)
3. Area .... requires more energy to heat up. (A - B)

9 Give reasons for:

1. Farming in desert is very difficult.

....

....

2. The mountains' ranges may form the rain shadow.

....

....

3. Hot air moves up, while cold air moves down.

....

....

4. At noon, sand on the beach is hotter than the sea water.

....

....

5. The air current is different from the wind.

....

....

6. The number of extreme weather disasters is expected to increase.

....

....

7 In some countries, floods have some benefits.

....

....

8 Flooding is worse if it is happening on a frozen ground.

....

....

9 Sandstorms have harmful effects on human health.

....

....

10 Sandstorms may increase road accidents.

....

....

10 What happens to:

1 Atmospheric pressure during climbing up a mountain?

....

....

2 The temperature when descending from the top of the mountain?

....

....

3 The paper spiral when you hold it over a lighted lamp?

....

....

4 Irrigation canals when dust of a sandstorm fills them?

....

....

5 Energy generation when dust builds up on solar panels?

....

....

Answers Concept 3.2

1

1 d	2 b	3 d	4 c	5 c
6 d	7 b	8 d	9 c	10 c
11 d	12 b	13 a	14 d	15 b
16 d	17 c	18 d	19 c	20 b
21 c	22 b	23 b	24 d	25 b
26 c				

2

1 ✗	2 ✓	3 ✗	4 ✗	5 ✗
6 ✓	7 ✗	8 ✗	9 ✓	10 ✓
11 ✗	12 ✗	13 ✗	14 ✗	15 ✗
16 ✗	17 ✗	18 ✓	19 ✗	20 ✓

3

1. Meteorologists
2. Meteorology
3. Rain shadow
4. Wet side
5. Dry side
6. Atmospheric pressure
7. Humidity
8. Desert
9. Barometer
10. Thermometer
11. Anemometer
12. Rain gauge
13. Weather radar
14. Wind
15. Air currents
16. Collecting (gathering) data
17. Put it all together
18. Drought
19. Flooding
20. Sandstorm

4

(A)
1. decreases - increases
2. rain shadow - humid
3. dry
4. vertically - horizontally

(B)
1. longer
2. weather radar - raingauge
3. Landforms
4. Clouds
5. Ice crystals

(C)
1. water quality - solar panels
2. flooding
3. Sandstorm
4. visibility

5

(A) 1 d 2 a 3 c 4 b

(B) 1 c 2 b 3 a

6

1. More precipitation
2. Barometer
3. Temperture
4. Thermometer
5. Precipitation

7

1. Area (B)
2. rises
3. more - sinks
4. 2

8

1. A
2. 26
3. B

9

1. Because the amount of water that evaporates in the desert is more than water that precipitate.
2. Because the mountain range blocks the humid air.
3. Because hot air is less dense than cold air.
4. Because sand heats faster than water.
5. Because air current moves vertically while wind move horizontally.
6. Due to the global climate change.
7. Because some countries depend on periodic floods.
8. Because the frozen ground doesn't absorb water.
9. Because dust may be inhaled by human or it may go into eyes.
10. Because it decreases visibility of driver and motorists.

10

1. Atmospheric pressure will decrease.
2. The temperature will increase.
3. The paper spiral will move without stopping.
4. The water quality of irrigation canals will be affected.
5. It may stop generation of energy.

Summary

Adaptation

It's a process that helps living organisms survive in their habitats.

Structural (Physical) Adaptation	Behavioral Adaptation
It's anything that is linked to the body structure of a living organism to help it survive in its habitat.	It's anything that a living organisms does or acts to help it survive in its habitat.

Examples

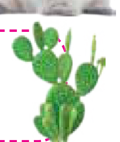
A polar bear has white fur.



Bird migration



The thorns on a plant's stem



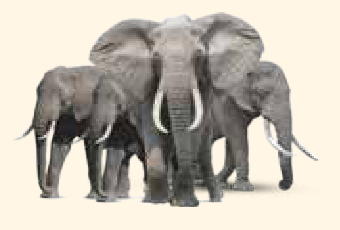
A plant growing towards light



Check your understanding?

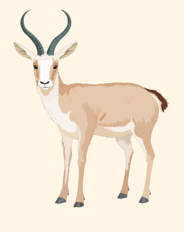
Classify these sentences by putting the letter (S) for structural adaptation and and the letter (B) for behavioral adaptation:

1. **Elephants live in herds.**



....

2. **Dorcas gazelles can go months without drinking water.**



....

Unit 4

Bird migration:

It is a behavioral adaptation in which birds move together from one place to another, usually seasonally.

Example



Steppe Eagle

Reasons of bird migration:

1. To find the best conditions to reproduce (breed).
2. To find different food resources.
3. To find suitable habitats at different times of the year.

Challenges that face migratory birds:

1. Extreme weather
2. Predators
3. Limited access to food and water
4. Limited resting sites due to habitat loss

- Migratory birds return to the place where they started, and the cycle of migration is repeated.
- Physical traits would help some birds survive their migration journey more than others.

Migratory Birds in Egypt:

- The Red Sea and Nile River are important stopovers for millions of migratory birds every year.

Falcons



Eagles



Reasons that attract migratory birds to Egypt:

1. The moderate winter climate
2. The Red Sea area includes different environments, such as: (a) Marine (b) Coastal (c) Mountains

Structural Adaptation of Animals

Animal	Habitat	Structural (Physical) Adaptation	Reason
Dorcas Gazelle	Desert and semi-desert (Egypt and the Middle East)	Fur color	Helps it hide.
Emperor Penguin	Antarctic	Thick blubber (fatty layer) covered with dense feathers	To keep its body warm.
African Penguin	Along the coast of South Africa	There is a circle of skin around its eyes without any feathers.	To cool off its body fast.
Arctic Fox	Arctic region	Thick fur	To keep its body warm.
		White fur	To blend in with the snow.
Poison Dart Frog	Tropical rainforests	Large eyes	To enable it to see at night
		Colorful poisonous skin	To hide from predators.
Lizard	Desert	Tough, sand-colored scales	To withstand heat and to hide among rocks in a desert.

- If natural resources are available, this helps living organisms to grow and survive.
- If natural resources are scarce, animals must rely on their inherited traits to adapt.

Structural Adaptation of Plants

Plants in Western Desert in Egypt

Palms



Acacia Trees

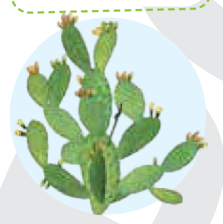
Opuntia

Spiny Shrubs

Grass











Physical Adaptation	Figure	Reason
Small and wiry (herbal)		To not lose water.
Short, shallow roots (extended near the Earth's surface)		To draw (absorb) any available water from the upper soil.
Thick stems or thick, leathery leaves		To store water.
Thorns (prickles) on the stem		To keep herbivores away.

Some plants have other ways to adapt to drought, such as:

When the rain falls in deserts:

1. They sprout and reach the flowering stage quickly.
2. Flowers produce long-lived seeds to adapt to little rainfall.

Ecosystem

It is an area that contains living organisms and nonliving things that interact with each other.

The Size of an Ecosystem

Small Ecosystem	Large Ecosystem
A small area of land between buildings that contains grass, insects, and weeds.	The Arctic where, • Caribou feed on grasses. • Wolves hunt the caribou and other prey.

The Components of an Ecosystem

Biotic Factors	Abiotic Factors
They are living organisms in an environment. Examples: • Humans • Animals • Plants	They are nonliving things in an environment. Examples: • Sunlight • Air • Soil • Water • Precipitation • Temperature

Limited Resources in the Desert



- Deserts are one of the most extreme environments on Earth that have little rainfall.
- Deserts may be hot areas or cold areas.

1 Hot deserts:

- They have very small amount of groundwater.
- Some plants benefit from temporary pools that form in rocks.
- Some plants have long roots to reach the deep groundwater.
- Other plants have very short roots, ready to catch the smallest drop of dew.

2 Cold deserts:

- Antarctica is a cold desert biome that has cold temperatures all year.

Unit 4

Factors Affecting Living Organisms' Growth and Survival

First: Environmental (Abiotic) Factors

They are external (outside) factors that influence the growth of living organisms.

Living organisms have basic needs, such as:

1. Light 2. Water 3. Food 4. Air 5. Size of habitat

1 Availability of Light (Abiotic Factors)

a) The intensity (quantity) of light:

- In general, plants use sunlight to make photosynthesis.
- If light is too intense, it may damage the plants' parts, making them die or burn.

b) The duration (amount) of light:

- Plants respond to the amount of light and dark they receive daily.

Some flowering plants may produce (bear) fruit when days are longer than nights.	Some flowering plants may produce (bear) fruit when days are shorter than night, such as in chrysanthemum.

2 Availability of Water

- Water is very important for all living organisms to survive and grow.

3 Size of Habitat

The size of the habitat can impact:

a) The number of different species. b) The amount of food.

c) Food relationships between living organisms.

Second: Genetics Factors

They are internal factors, like a set of genetic information passed down from parents to offspring to determine their traits.

ⓐ Size:

Under the right conditions, an organism grows to be approximately the size of its parents.

ⓑ Length:

The length of the organisms in the same species is similar.

ⓒ The fur color:

The fur color is often similar to the color of one of the parents.

The Inherited Traits in living Organisms

- A genetic factor controls which traits get passed down from the parents to the offspring.
- The inherited traits affect the structure of living organisms.





Eye color and nose shape

2 In animals:



Pointy ears in cats





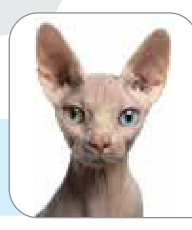
Shape of leaves

Hereditary traits They are the traits that are genetically passed on from the parents to the offspring.

Unit 4

1 Hereditary Traits in Animals





Birman Cat	Sphynx Cat
It has long, silky hair with different colors.	It does not have any hair or may have fine hair.
Their Kittens	
A Birman kitten inherits its long, silky hair from its parents.	A Sphynx kitten inherits its hairless body from its parents.
Similarity	
They belong to the same species that is called Felis catus.	

There is no Sphynx cat with long hair like a Birman. 
Because the Sphynx does not have the same genetic factors for long hair as those found in Birman.

2 Hereditary Traits in Desert Plants

Similarities:

1. Desert plants grow in the same soil.
2. Desert plants are exposed to the same amount of light.

Differences:

Desert plants have different colors, shapes, sizes, and heights.
Because they have different genetic factors.

Scientists analyzed many deserts, and they found that:

- Desert plants have adapted to arid conditions, such as:
  - Extreme Sun
  - Very little rainfall
- Each generation becomes stronger as the inherited traits transfer from the parents to their offspring.

Factors that Influence Human Growth and Behavior Development

1 Lifestyle Choices:

- Many of our lifestyle habits impact our health, growth, and development.



Bad Habits (Lifestyle)

Such as:
1. Smoking
2. Eating diets that include chips and soda

They negatively affect your health and growth.

Good Habits (Lifestyle)

Such as:
1. Exercises
2. Eating diets that include proper nutrition

They positively affect your health and growth.

2 Environmental Factors:

- People do not have the ability to control the environmental factors.

Unhealthy Environment

They negatively affect your health and growth.

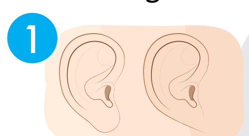
Healthy and Clean Environment

They positively affect your health and growth.

Some problems in unhealthy environments:
1. Healthcare is not available.
2. Water may be far away or unsafe to drink.
3. Food may be hard to find.
4. Sanitation is not available, which leads to the spread of diseases.

3 Genetic Factors:

- Genetic factors control the transfer of inherited traits from parents to offspring.
- Genes are tiny structures found in the cell nucleus that carry inherited traits, so they determine:

1. 
The way your earlobes hang.

2. 
The length of your fingers.

3. 
Your height

General Exercises on Concept 4.1

1 Choose the correct answer:

1. All the following are examples of physical adaptation, except ....
   a. the fur color
   b. bird's migration
   c. the fatty layer
   d. the thorns on a stem

2. The polar bear ability to live in cold regions is considered ....
   a. a behavioral adaptation
   b. a structural adaptation
   c. reproduction ways
   d. environmental changes

3. All the following are migratory birds, except ....
   a. falcons
   b. flamingos
   c. eagles
   d. penguins

4. The .... is one of the challenges that migratory birds face on their journey.
   a. availability of water
   b. size of the habitat
   c. moderate weather
   d. limited resting sites

5. .... are not adapted to live in extreme cold weather.
   a. Caribou
   b. Arctic foxes
   c. African penguins
   d. Wolves

6. .... live in tropical rainforests.
   a. Caribou
   b. Dorcas gazelles
   c. Emperor penguins
   d. Poison dart frogs

7. .... may be found in the same habitat as lizards.
   a. Emperor penguins
   b. Arctic foxes
   c. Poison dart frogs
   d. Dorcas gazelles

8. The Arctic fox is an example of a/an ....
   a. large ecosystem
   b. biotic factor
   c. environmental factor
   d. abiotic factor

9. Some desert plants are small and wiry (herbal) to .... water.
   a. store
   b. absorb
   c. lose
   d. not lose

10. All the following plants grow in the Western Desert in Egypt, except ....
    a. palms
    b. opuntia
    c. pine trees
    d. acacia trees

11 Desert plants usually have .... to keep animals away.

a. small leaves b. thick stem c. herbal shape d. prickles

12 Hot deserts are characterized by the presence of all the following, except ....

a. temporary ponds
b. little groundwater
c. moderate climate
d. little rainfall

13 Desert plants usually have thick stems or leaves to ....

a. lose water b. store water c. absorb water d. gain water

14 All the following are inherited traits in humans, except the ....

a. ear shape b. nose shape c. fur color d. eye color

15 All the following are abiotic factors, except ....

a. light b. trees c. water d. air

16 A baby rabbit looks like its parents as a result of ....

a. environmental factors
b. genetic factors
c. lifestyle
d. good habits

17 Both Birman and Sphynx cats are similar in ....

a. their hairless bodies
b. being wild cats
c. being from the Felis catus
d. their hair length

18 The kittens of Sphynx cats inherit their .... from their parents.

a. silky hair b. hairless body c. hair color d. fur color

19 The characteristics that you get from your parents are called ....

a. inherited traits
b. environmental factors
c. lifestyle choices
d. acquired traits

20 The growth of a child will be affected by ....

a. the lifestyle choices
b. the environmental factors
c. the genetic factors
d. all the previous answers

21 A healthy environment is characterized by the presence of ....

a. polluted water
b. no sanitation
c. diseases
d. healthcare

22 All the following lifestyles (habits) make our bodies healthy, except ....

a. a proper nutrition
b. smoking
c. avoiding drinking soda
d. exercising

2 Put (✓) or (✗):

1. "Animals living in a herd" is an example of behavioral adaptation. ( )
2. The growth of a plant toward light is a structural adaptation. ( )
3. Birds migrate to areas that have extreme climate. ( )
4. Migratory birds never return to their homelands. ( )
5. It is easy for animals to live in the desert environments. ( )
6. Each environment on Earth has specific climate, plants, and animals. ( )
7. All living organisms inherit their traits from their offspring. ( )
8. An emperor penguin has thick fur to keep its body warm. ( )
9. In the Arctic, a caribou eats wolves that feed on grasses. ( )
10. Acacia trees and the Arctic fox live in two different environments. ( )
11. The colorful poisonous skin of a poison dart frog helps it stay safe. ( )
12. The Arctic fox has white fur to warm its body. ( )
13. Acacia trees and Dorcas gazelles live in the same habitat. ( )
14. Plants respond to the amount of light and dark they receive daily. ( )
15. All deserts on Earth have dry and hot climate. ( )
16. The Western Desert in Egypt is important an stopover for migratory birds. ( )
17. Deserts may be hot areas or cold areas. ( )
18. Light is one of the biotic factors that affect the growth of plants. ( )
19. Chrysanthemum produces flowers when the day is longer than the night. ( )

20 The genetic traits are passed down from the offspring to the parents. ( )

21 Genes are tiny structures found in the cell nucleus. ( )

22 Sphynx and Birman cats are different in the hair length. ( )

23 Your lifestyle choices affect your health and growth. ( )

24 People do not have the ability to control the environmental factors. ( )

25 The abiotic factors of an ecosystem can eat and grow. ( )

3 Write the scientific term:

1 It is a process through which a living organism is able to survive in its habitat. (..........)

2 It is anything related to the body of the living organism that helps it survive. (..........)

3 It is anything that the living organism does or acts to survive. (..........)

4 It is a behavioral adaptation in which birds move together from one place to another, usually seasonally. (..........)

5 It is an important stopover in Egypt for migratory birds, which includes marine, coastal, and mountain environments. (..........)

6 It is an area that contains biotic and abiotic factors that interact with each other. (..........)

7 They are the factors that include all living organisms in an ecosystem. (..........)

8 They are the factors that include nonliving things in an ecosystem. (..........)

9 It is a large ecosystem where wolves and caribou live. (..........)

10 It is a type of gazelle that lives in the deserts and semi-deserts of Egypt. (..........)

11 It is a penguin that has a fatty layer covered with dense feathers. (..........................)

12 It is a penguin that has a circle of skin without feathers surrounding its eyes. (..........................)

13 It is a type of cat that has a hairless body. (..........................)

14 It is a type of cat that has long, silky hair with different colors. (..........................)

15 They are the factors that are passed down from parents to offspring. (..........................)

16 They are external (outside) factors that influence the growth of living organisms. (..........................)

17 They are found inside the cell's nucleus, and they are responsible for determining the body structure. (..........................)

18 It is a desert biome that has a cold climate all year. (..........................)

4 Complete the following using the words between the brackets:

A (moderate – physical – cold – genetic – behavioral – environmental)

1 "Some animals living in herds" is an example of .... adaptation.

2 The length of a tree is considered a (an) .... factor.

3 The fur color of most animals is an example of .... adaptation.

4 Arctic foxes and emperor penguins are adapted to live in extreme .... climate.

5 The size of the habitat is considered a (an) .... factor.

6 The .... climate of Egypt attracts some migratory birds in winter.

B (seeds – stem – roots – different – the same – leaves)

1 Lizards and Dorcas gazelles could live in .... environment(s).

2 African penguins and Arctic foxes live in .... environment(s).

3 Desert plants produce long-lived .... when there is rainfall.

4 Some desert plants can store water in their .... and ....

5 Some desert plants have long .... to reach the deep groundwater.

C (fine – nucleus – long and silky – growth – hereditary traits)

1 The offspring of a Birman cat has .... hair on its body.

2 The .... are genetically passed down from the parents to the offspring.

3 Genes are tiny structures found in the .... of the cell.

4 The lifestyle choices affect our ...., heath, and development.

5 The kitten of a Sphynx cat may have .... hair or hairless body.

5 Choose from column (A) what suits it in column (B):

A

Column (A)	Column (B)
1 Light	a. is an example of structural adaptation.
2 Fur color	b. is an ecosystem.
3 Bird migration	c. is an example of abiotic factors.
4 The Arctic	d. is an example of behavioral adaptation.

1 .... 2 .... 3 .... 4 ....

B

Column (A)	Column (B)
1 Lizards	a. have thick fur.
2 Arctic foxes	b. have dense feather.
3 Poison dart frogs	c. have sandy scales.
4 Emperor penguins	d. have colorful skin.

1 .... 2 .... 3 .... 4 ....

C

Column (A) Physical adaptation in desert plants	Column (B) Reason
1 Thick stems	a. To not lose water
2 Short, shallow roots	b. To store water
3 Thorns on the stem	c. To absorb any available water from the soil
4 Small and wiry shape	d. To keep herbivores away

1 .... 2 .... 3 .... 4 ....

D

Column (A)	Column (B)
1 A Birman cat	a. leads to the spread of diseases.
2 A Sphynx cat	b. has long and silky hair.
3 An unhealthy environment	c. positively affects the growth of living organisms.
4 A good lifestyle	d. has hairless body.

1 .... 2 .... 3 .... 4 ....

6 Cross out the odd word:

1. Living in a herd – Withstanding thirsty – Thorns on the stem – Migration (..........................)
2. Water – Light – Eye color – Size of the habitat (..........................)
3. Gazelle's size – Gazelle's height – Gazelle's habitat – Gazelle's fur color (..........................)
4. Thorns on the stem – Short roots – Thick leaves – Wide leaves (..........................)
5. Caribou – Acacia trees – Wolves – Grass (..........................)
6. Smoking – Eating chips – Drinking soda – Exercises (..........................)

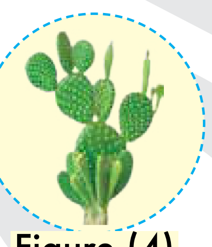


7 Study the following figures, then put (✓) or (✗):


Figure (1)


Figure (2)


Figure (3)


Figure (4)

1. In figure (1), the mother inherits the eye color from her daughter. ( )
2. The thorns on the stem in figure (4) are an example of behavioral adaptation. ( )
3. The animals in figures (2) and (3) belong to different species. ( )
4. The animals in figures (2) and (3) have different hair length. ( )

8 Give reasons for:

1. Dorcas gazelles can't be seen easily by predatory animals.

   ....

   ....

2. Falcons and eagles migrate to Egypt in winter.

   ....

   ....

3. Lizards have sandy-colored scales, while poison dart frogs have colorful, poisonous skin.

   ....

   ....

4. The African penguin has a circle of skin without feathers around its eyes.

   ....

   ....

5. The emperor penguin has a fatty layer covered with dense feathers.

   ....

   ....

6 Some desert plants have short, extended roots near the Earth's surface.

....

....

7 Some desert plants have long, extended roots.

....

....

8 Some desert plants have thorns on their stems.

....

....

9 A Sphynx cat doesn't have long hair like a Birman cat.

....

....

10 You should avoid smoking and eating a lot of chips.

....

....

9 What happens to:

1 Living organisms if water in an ecosystem becomes limited?

....

....

2 The plants if they receive too intense light?

....

....

3 The polar bear if it has dark fur?

....

....

4 The plant if it is placed without receiving light near a window?

....

....

Answers
Concept 4.1

1
1 b 2 b 3 d 4 d 5 c
6 d 7 d 8 b 9 d 10 c
11 d 12 c 13 b 14 c 15 b
16 b 17 c 18 b 19 a 20 d
21 d 22 b

2
1 ✓ 2 ✗ 3 ✗ 4 ✗ 5 ✗
6 ✓ 7 ✗ 8 ✗ 9 ✗ 10 ✓
11 ✓ 12 ✗ 13 ✓ 14 ✓ 15 ✗
16 ✗ 17 ✓ 18 ✗ 19 ✗ 20 ✗
21 ✓ 22 ✓ 23 ✓ 24 ✓ 25 ✗

3
1 Adaptation
2 Structural adaptation
3 Behavioral adaptation
4 Bird migration 5 Red Sea
6 Ecosystem 7 Biotic factors
8 Abiotic factors 9 The Arctic
10 Dorcas gazelle
11 Emperor penguin
12 African penguin
13 Sphynx cat 14 Birman cat
15 Genetic factors
16 Environmental factors
17 Genes 18 Antarctica

4
(A) 1 behavioral 2 genetic
3 physical 4 cold
5 environmental
6 moderate
(B) 1 the same 2 different
3 seeds 4 leaves – stem
5 roots
(C) 1 long and silky
2 hereditary traits
3 nucleus 4 growth
5 fine

5
(A) 1 c 2 a 3 d 4 b
(B) 1 c 2 a 3 d 4 b
(C) 1 b 2 c 3 d 4 a
(D) 1 b 2 d 3 a 4 c

6
1 Thorns on thevstem
2 Eye color
3 Gazelle's habitat
4 Wide leaves
5 Acacia trees 6 Exercises

7
1 ✗ 2 ✗ 3 ✗ 4 ✓

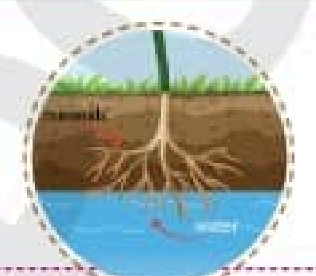
8
1 Due to their fur color, which helps them hide in deserts.
2 Due to the moderate winter climate in Egypt.
3 Lizards have sandy-colored scales to hide among the rocks in deserts, while poison dart frogs have colorful, poisonous skin to protect themselves from predators.
4 To cool its body fast.
5 To keep its body warm.
6 To absorb any available water from the upper soil.
7 To reach the deep groundwater.
8 To keep herbivores away.
9 Because they have different genetic factors.
10 To grow healthy because they negatively affect our growth and health.

9
1 The living organisms must adapt or they will not survive.
2 The plants parts may be damaged by drying or burning.
3 The polar bear can't hide and can't find food, so it may die.
4 The plant will grow toward light.

Summary

Soil It is a loose layer (delicate skin) that covers the Earth's crust.

Soil Importance:



Soil provides plants' roots with water, nutrients, and air.



Soil provides animals and humans with food.



Soil is home (shelter) for some insects, like bacteria and worms.

Soil Formation:

1. Rocks are broken down into smaller pieces through weathering.
2. The small pieces of rocks are carried away through erosion.
3. The small pieces precipitate and combine with other ingredients to form soil during deposition.

Soil Properties:



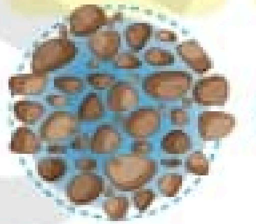
Fertility



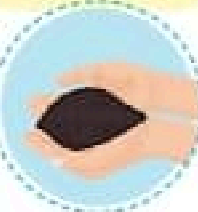
Appearance



Ability to retain water



Texture





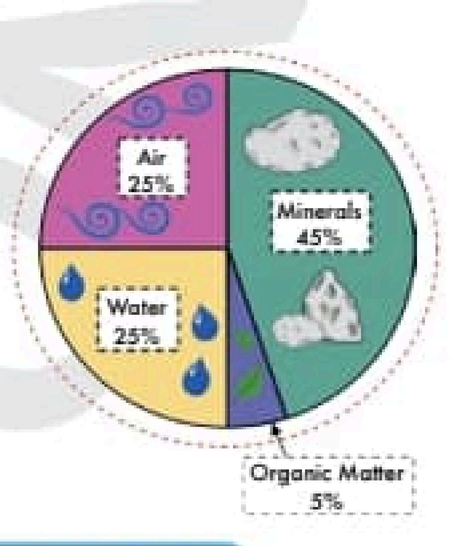
Particles size



Unit 4

Soil Components:

- Soil is a mixture of different components with different sizes.
- You can see some of the soil components, but you can't see others.
- Soil consists of four main components: water, air, minerals, and organic matter.



All types of soil are composed of:

- Inorganic ingredients
- Organic Ingredients

1 Inorganic Ingredients:

- They are nonliving things in the soil.

Examples: Water | Air | Rocks | Minerals

- 50% of the soil is composed of pores (spaces among particles) that are filled with water or air.
- Minerals are the building units (blocks) of rocks.

The different amounts of inorganic ingredients can change:

1. The appearance of the soil.
2. The texture of the soil.
3. The ability of the soil to retain water.
4. The ability of the soil to allow plants' roots to grow.

2 Organic Ingredients:

- They are the remains of dead organisms in the soil.

Examples | Humus | Living organisms

- Soil fertility increases by increasing the amount of organic matter in the soil.

Decomposers:

- Decomposers are environmental cleaners.
- Decomposers play an important role in balancing the ecosystem.



Examples:	Bacteria, Fungi, Earthworms
Their role in the ecosystem:	• Decomposers break down the organic matter of dead organisms into humus. • Decomposers recycle chemical nutrients, such as carbon, nitrogen, and oxygen, from dead plants and animals back into the soil, air, and water.

Humus:

- It is a dark, rich-nutrient organic matter that helps plants grow and it is formed from the decomposition of dead organisms.

The different amounts of organic ingredients in the soil can change:

- The appearance of the soil.
- The soil fertility.

Types of Soil:



P.O.C	Sand	Silt	Clay
Color	Yellow	Gray	Dark brown (Black)
Particles Size	Large	Medium	Small
Compactness	Non-compacted	Moderate	High
Draining Water	Fast	Medium	Slow
Retaining Water	Low	Medium	High

- Silt is the most fertile soil because the soil that retains a medium amount of water keeps its organic materials.

Using Soil to Build Homes:

P.O.C	Traditional Homes	Sustainable Homes
Depend on	Brick and cement	Eco-friendly materials
The industry of building materials	• Bricks must be burned at more than 1,000°C. • Cement ingredients must be burned at 1,450°C.	① Scientists use subsoil. (Not topsoil that is used in agriculture) ② Scientists add chemicals to turn clay into glue-like matter. ③ Glue-like matter binds the soil components together.
Which one is better?	Disadvantages: ① It requires a lot of energy. ② It causes a lot of pollution.	Advantages: ① It saves energy. ② It reduces pollution.
	Soil scientists and engineers hope to use eco-friendly materials and stop depending on traditional brick and cement.	

Soil and Climate:

The climate in an area affects the characteristics of the soil.

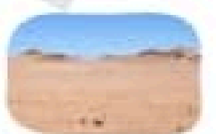
1 Humid Areas:



- In humid areas, the soil contains a huge amount of water, which leads to:

A. Waterlogged soil	It contains very little air for roots to grow and for organisms to live.
B. During precipitation	• Nutrients may be washed away from the soil. • Minerals may fall below the soil layers to form a hard layer that roots can't penetrate.

2 Dry Areas:



- The dry clay forms a layer that cannot absorb much water.

The soil in an area affects the climate.

- The types of plants that can grow in the soil can have a large impact on the temperature and weather conditions in an area.

Examples of how soil impacts ecosystems

① Desert Soils	② Soil in a Bog
Characteristics	
• Dry • Loose soil • It drains water fast.	• Wet • Compacted • It holds water.
Plants that live there	
Savannas contain grasses and some small plants.	Plants that can grow in wet soil form the basis of a bog ecosystem.
Animals that live there	
Herbivores: Animals that eat grasses and small plants. Examples: Deer (Gazelles) Carnivores: Animals that eat herbivores. Examples: Lions , cheetahs, and leopards	 Frogs  Insects, such as mosquitoes

Human activities that impact soil:

1 Soil Depletion:

① Converting arable lands to cities, farms, and pastures
② Overusing pesticides, chemical fertilizers, and other pollutants

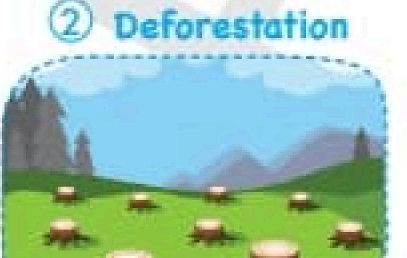
2 Desertification:

It's a process in which soil becomes infertile due to:

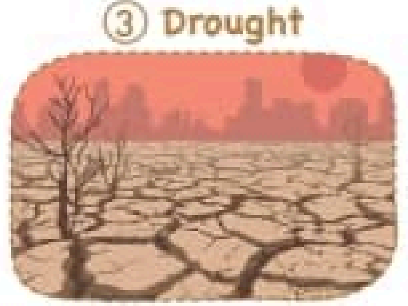
① Overgrazing



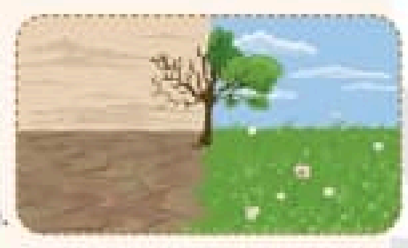
② Deforestation



③ Drought



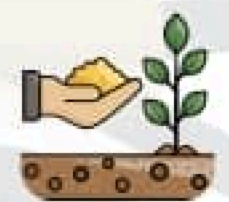
- Nearly 50% (half) of the topsoil on the Earth has been lost in the last 150 years.
- Up to 38% of the world's land is composed of arid regions that are exposed to desertification.



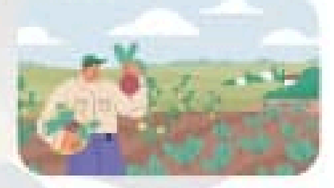
Soil Restoration:

- Soil scientists and farmers can restore soil by:

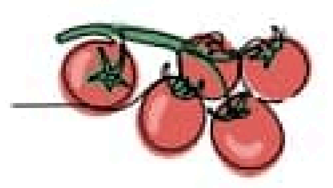
① Adding back nutrients to the depleted soil using:
a. Crop (residues) such as straw and stalks.
b. Natural fertilizers such as animal manure.



② Crop diversification, which means planting different types of crops and rotating them.





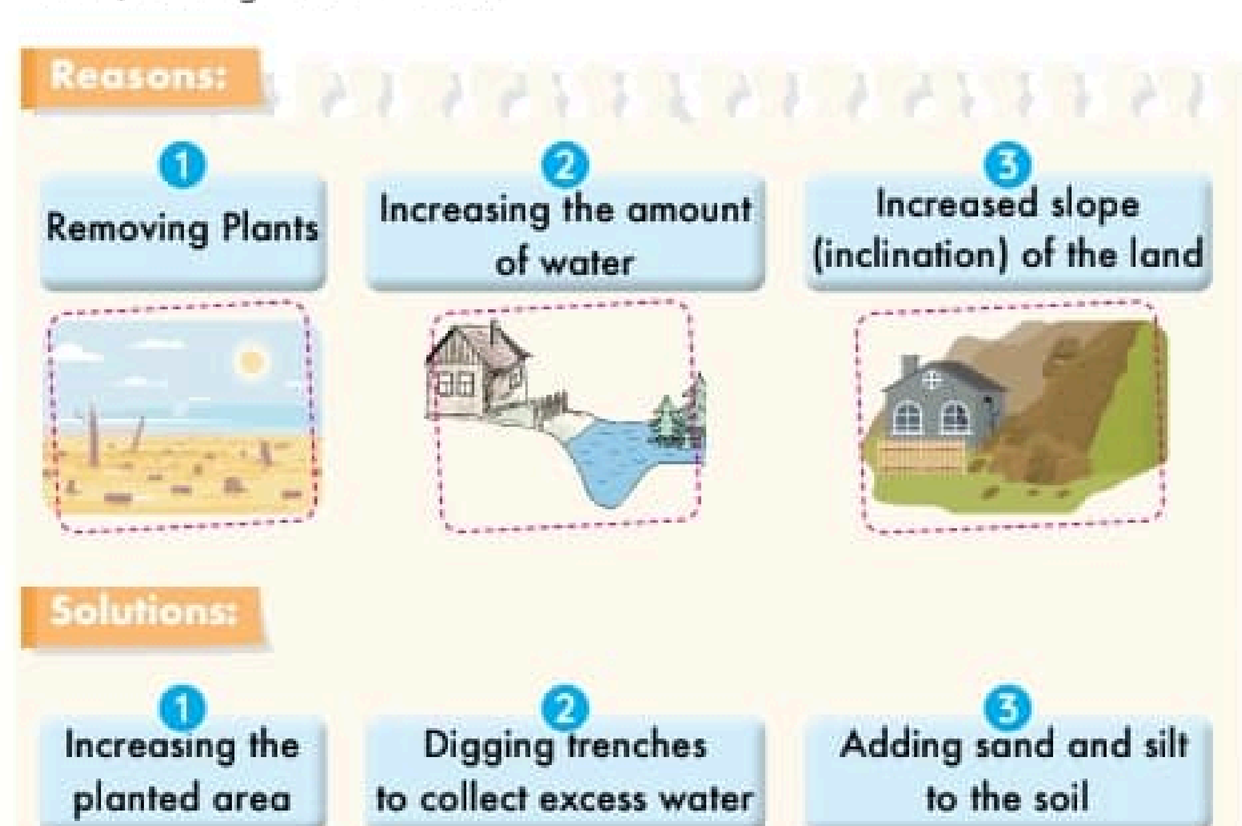


- Tomatoes crops need:
  1. Regular, moderate irrigation.
  2. Suitable amount of organic fertilizers.

- Unsuitable environmental factors can lead to:
  1. Reducing crops.
  2. Producing weak plants.
  3. Spreading plant diseases.

Soil Erosion

- There are many factors that impact how quickly water moves over the land, leading to soil erosion.



Habitat Destruction:

Habitat It is a place where living organisms live.

Examples:	• Deserts • Forests • Grasslands • Streams • Oceans
Importance:	• It provides living organisms with natural resources, such as water, food, shelter, and space.

• Habitat destruction happens when one of the natural resources is depleted or taken away.

Reasons of Habitat Destruction

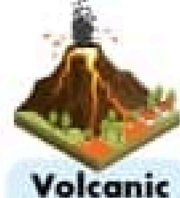


A Natural Changes



1 Dynamic environment:

• Earth is constantly going through changes, such as:



Volcanic eruptions



Forest fires



Hurricanes



Earthquakes



Floods



Diseases and lack of food

Some positive effects of natural changes:

Volcanic eruptions  make the soil fertile.

Forest fires  release seeds from sealed pods.

Diseases  keep the population at a suitable number.

Concept 2

2 Changing the number of one species:

- Overpopulation leads to less food, water, shelter, and space for other populations that live in the habitat, leading to habitat destruction.

a When large predators disappear from an area:

Prey population will increase.



Leads to

The amount of natural resources will decrease.



Leads to

Habitat destruction.

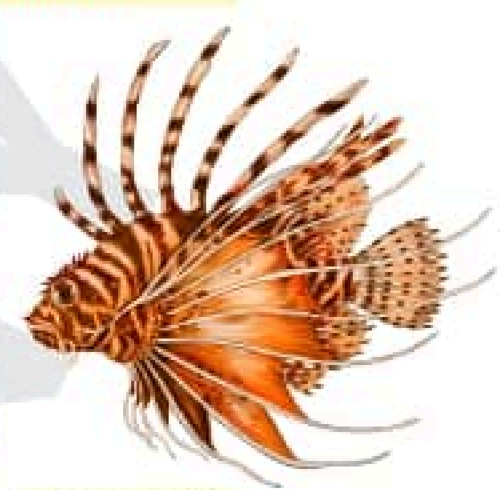


b When invasive species come into an area:

When new species come into an area, they can become invasive species.

Their number increases because they have no predators.

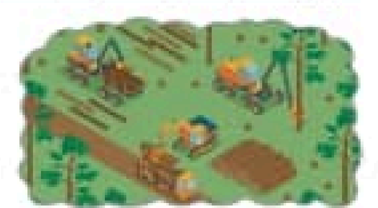
They become a dominant population because they kill all the native species.



Example

In some areas of the Red Sea, lionfish kill about 79% of young native fish.

B Human Activities

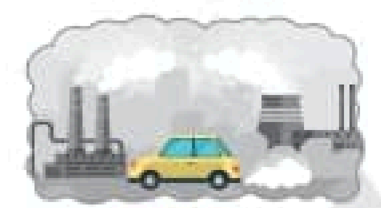


1 Development and waste:

- As the human population grows, humans build houses, factories, and infrastructures, which lead to:

Factories to produce goods
Infrastructures for transportation

a Deforestation:



- Natural spaces (hills, prairies, and valleys) are turned into factories and homes.
- Lands have been destroyed for mining, roads, and airport runways.

b Pollution:

Pollution and waste disposal in landfills cause:

- An increase in the percentage of carbon dioxide gas and other gases in the air.
- At the end, this leads to increasing the Earth's temperature.

2 Climate change:

Human Activities → Lead to → Habitat Destruction → Leads to → Climate Change

Plants and animals change their behavior to adapt to the new habitat.



Sometimes populations are not able to adapt or move, so they become extinct.

How to reduce water pollution





The human population is constantly growing. **Which leads to** Increasing the number of industries that use and pollute water.

Preventing pollution is more effective than cleaning up pollution. G.R

Because cleaning up pollution requires a lot of time and effort.

Methods to reduce water pollution

1. Applying laws to prevent water pollution
2. Controlling air pollution from cars and industry
3. Treatment of sewage and industrial water



4. Correctly getting rid of trash



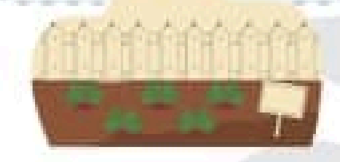
5. Keeping planted areas



6. Correctly applying fertilizers.



7. Using soil fences and sedimentation ponds



General Exercises on Concept 4.2

1 Choose the correct answer:

1. ______ is the loose layer which covers the Earth's crust.
   a. Atmosphere b. Water c. Soil d. Plant
2. The ______ weather may cause the soil to lose its nutrients.
   a. moderate b. cold c. windy d. hot
3. All the following are the soil components, except ______ .
   a. minerals b. clouds c. air d. water
4. ______ are the building blocks of rocks.
   a. Minerals b. Humuses c. Bricks d. Nutrients
5. All the following are considered inorganic components of soil, except ______ .
   a. air b. water c. minerals d. humus
6. Soil is formed as a result of the ______ and ______ processes.
   a. weathering – transpiration b. erosion – respiration
   c. weathering – erosion d. condensation – erosion
7. A healthy soil provides green plants with all the following components, except ______ .
   a. air b. water c. humus d. sunlight
8. Soil is considered a shelter for some ______ .
   a. carnivores b. birds c. insects d. all the previous
9. Rocks are broken down into smaller pieces through the process of ______ .
   a. deposition b. weathering c. erosion d. photosynthesis
10. All the following living organisms are decomposers, except ______ .
    a. bacteria b. fungi c. mosquitoes d. earthworms
11. There are ______ between soil particles which contain water and air.
    a. minerals b. humuses c. rocks d. pores

12 The soil that retains ______ amount of water becomes more fertile.

a. high b. low c. medium d. no

13 The ability of ______ soil to retain water is greater than that of silt soil.

a. sand b. clay c. desert d. fertile

14 Silt soil has a ______ color.

a. yellow b. brown c. gray d. black

15 The soil that has ______ particles drains water very quickly.

a. small b. medium c. large d. fine

16 Decomposers recycle all the following materials back to the soil, except ______ .

a. oxygen b. carbon c. minerals d. nitrogen

17 All the following are characteristics of humus, except that it is ______ matter.

a. dark b. inorganic c. organic d. rich-nutrients

18 Waterlogged soil contains ______ amount of water and ______ amount of air.

a. little – large b. medium – medium

c. large – little d. large – medium

19 Soils with large spaces between the particles are characterized by the ability to drain water ______ and retain it ______ .

a. slowly – well b. quickly – well

c. quickly – poorly d. slowly – poorly

20 All the following animals can survive in savannas dry grassland, except ______ .

a. deer b. frogs c. leopards d. lions

21 All the following animals are carnivores, except ______ .

a. cheetahs b. leopards c. gazelles d. lions

22 All the following are human activities that cause habitat destruction, except ______ .

a. overgrazing b. deforestation c. floods d. desertification

23 ______ means planting different types of crops and rotating them.
a. Overgrazing b. deforestation
c. Soil depletion d. Crop diversification

24 Farmers and soil scientists can restore soil by adding ______ to the depleted soil.
a. pesticides b. animal manure
c. rocks d. chemical fertilizers

25 ______ increase(s) soil fertility.
a. Overgrazing b. Deforestation
c. Floods d. Volcanic eruptions

26 Lionfish is an example of a/an ______ species in the Red Sea.
a. native b. invasive c. endangered d. extinct

27 A habitat provides living organisms with ______ .
a. water b. food c. shelter d. all the previous

28 All the following are restorative practices that keep the soil healthy, except ______ .
a. using crops residues b. using chemical fertilizers
c. using natural fertilizers d. crop diversification

29 All the following are dynamic natural changes, except ______ .
a. earthquakes b. hurricanes c. deforestation d. floods

30 When large predators disappear from an area, prey's number ______ .
a. decreases b. increases
c. doesn't change d. stays constant

31 The part of the soil which is used to make eco-friendly building materials is ______ .
a. mantle b. topsoil c. subsoil d. minerals

32 All the following activities can reduce water pollution, except ______ .
a. overusing chemical fertilizers b. treatment of sewage
c. getting rid of trash correctly d. controlling air pollution

2 Put (✓) or (✗):

1. All types of soil on Earth are similar in color and appearance. (   )
2. There are pores between the particles of the soil. (   )
3. The amount of inorganic matter in the soil is greater than that of organic matter. (   )
4. The ability of soil to retain water depends on the size of the particles. (   )
5. Soil fertility depends on the amount of inorganic matter in the soil. (   )
6. There are no living organisms living in the soil. (   )
7. The weathering process always takes place after erosion. (   )
8. You can see all the soil components with your naked eye. (   )
9. Increasing the temperature may cause soil drought. (   )
10. The particles of sand are smaller than those of clay. (   )
11. Sand soil drains water faster than silt soil. (   )
12. The soil that keeps its organic material becomes more fertile. (   )
13. Silt particles are larger than clay particles. (   )
14. Savannas are wet grassland ecosystems. (   )
15. Plant roots can't grow in waterlogged soil. (   )
16. Herbivores depend on eating carnivores to survive. (   )
17. Decomposers are environmental cleaners. (   )
18. Without healthy topsoil, it is more difficult to grow crops. (   )
19. The overuse of chemical fertilizers can deplete the soil. (   )
20. Adding natural fertilizers to the soil is better than adding chemical fertilizers. (   )
21. Digging trenches can help reduce soil erosion. (   )
22. Increasing the slope of the land causes less soil erosion. (   )

23 By increasing the carbon dioxide in the air, the Earth's temperature increases. ( )

24 Lionfish are invasive species that are found in the Red Sea. ( )

25 Preventing pollution is more effective than cleaning it. ( )

26 Overpopulation may cause a shortage of food resources. ( )

27 Traditional bricks are made from eco-friendly materials. ( )

28 To build sustainable homes, we need a lot of energy. ( )

3 Write the scientific term:

1 It is the loose layer that covers the Earth's crust. (..................)

2 It is the process by which rocks are broken down into smaller pieces. (..................)

3 It is the process in which weathered rocks are carried away to another place. (..................)

4 They are the spaces found between soil particles that contain air and water. (..................)

5 They are the building blocks of rocks. (..................)

6 They are living organisms that recycle nutrients from dead organisms back to the ecosystem. (..................)

7 It is a dark organic matter formed in the soil by the decomposition of dead organisms. (..................)

8 It is a type of soil that retains a medium amount of water. (..................)

9 It is the soil that has large-sized particles and its color is yellow. (..................)

10 It is the brown soil that can retain a large amount of water. (..................)

11 It is a grassland ecosystem that contains dry sand soil in central Africa. (..................)

12 They are animals that feed on grassy fields. (..........)

13 They are animals that feed on herbivores. (..........)

14 It is a place where living organisms live. (..........)

15 They are species that were introduced to a new habitat naturally or by humans. (..........)

16 It is a layer of soil used for agriculture. (..........)

17 It is a type of soil used in making eco-friendly building materials. (..........)

4 Complete the following using the words between the brackets:

A (air – slower – faster – pores – waterlogged – increases – shelter – minerals)

1 The building units of rocks are called ....

2 Soil is a .... for bacteria and worms.

3 The spaces among the particles of the soil are called ....

4 Silt soil drains water .... than clay soil.

5 As the size of the soil particles ...., it drains water faster.

6 Humid areas may have .... soil that has a little amount of ....

B (frogs – decrease – gazelles – Lionfish – increases – Volcanic eruptions)

1 When large predators disappear from an area, prey's number ....

2 As the population grows, the food resources ....

3 Herbivores, like ...., live in savannas ecosystem, while .... live in bug soil.

4 .... make the soil fertile.

5 .... are examples of invasive species in the Red sea.

5 Cross out the odd words:

1. Earthworms – Rocks – Fungi – Bacteria
2. Minerals – Humus – Water – Air
3. Lions – Cheetahs – Frogs – Gazelles
4. Volcanic eruptions – Overgrazing – Hurricanes – Earthquakes
5. Drought – Earthquakes – Deforestation – Overgrazing

6 Complete the following table:

P.O.C	Sand Soil	Silt Soil	Clay Soil
1 Color	....	....	....
2 Size of particles	....	....	....
3 Flowing of water through it	....	....	....
4 Retaining water	....	....	....

7 Classify the following activities into natural changes or human activities:

(Earthquakes – Building factories – Floods – Deforestation – Diseases)

Natural Changes	Human Activities
....	....
....	....

8 Give reasons for:

1. Soil is very important for plants.

2. Decomposers are considered to be environmental cleaners.

3. Sand soil drains water very fast.

4. Clay soil retains a high amount of water.

5. The soil that retains a medium amount of water is more fertile.

6. Large trees can't grow in savanna grassland ecosystems.

7. We should reduce the amount of chemical fertilizers.

8. The desertification process has increased in recent years.

9. Volcanic eruptions may benefit the soil.

10 Preventing pollution is more effective than cleaning it.

____

____

11 The industry of traditional bricks and concrete has many disadvantages.

____

____

12 Soil scientists hope to build sustainable homes using eco-materials.

____

____

9 What happens if:

1 The temperature in the ecosystem increases? (According to the soil)

____

____

2 The amount of organic matter increases in the soil?

____

____

3 The soil that holds a medium amount of water?

____

____

4 We add many chemical fertilizers to the soil?

____

____

5 The percentage of carbon dioxide gas increases in the air?

____

____

6 Large predators disappear from a habitat? (According to the number of prey)

____

____

Answers Concept 4.2

1

1 c, 2 d, 3 b, 4 a, 5 d, 6 c
7 d, 8 c, 9 b, 10 c, 11 d, 12 c
13 b, 14 c, 15 c, 16 c, 17 b, 18 c
19 c, 20 b, 21 c, 22 c, 23 d, 24 b
25 d, 26 b, 27 d, 28 b, 29 c, 30 b
31 c, 32 a

2

1 ✗, 2 ✓, 3 ✓, 4 ✓, 5 ✗, 6 ✗
7 ✗, 8 ✗, 9 ✓, 10 ✗, 11 ✓, 12 ✓
13 ✓, 14 ✗, 15 ✓, 16 ✗, 17 ✓, 18 ✓
19 ✓, 20 ✓, 21 ✓, 22 ✗, 23 ✓, 24 ✓
25 ✓, 26 ✓, 27 ✗, 28 ✗

3

1. Soil
2. Weathering
3. Erosion
4. Pores
5. Minerals
6. Decomposers
7. Humus
8. Silt soil
9. Sand soil
10. Clay soil
11. Savanna
12. Herbivores
13. Carnivores
14. Habitat
15. Invasive species
16. Topsoil
17. Subsoil

4

(A)
1. minerals
2. shelter
3. pores
4. faster
5. increases
6. waterlogged – air

(B)
1. increases
2. decrease
3. gazelles – frogs
4. Volcanic eruptions
5. Lionfish

5

1. Rocks
2. Humus
3. Frogs
4. Overgrazing
5. Earthquakes

6

P.O.C	Sand Soil	Silt Soil	Clay Soil
1 Color	Yellow	Gray	Dark
2 Size of particles	Large	Medium	Small
3 Flowing of water through it	Fast	Medium	Slow
4 Retaining water	Low	Medium	High

7

Natural Changes	Human Activities
Earthquakes	Building factories
Diseases – Floods	Deforestation

8

1. Because soil provides plants with water, nutrients, and air.
2. Because decomposers break down organic matter in dead things and recycle nutrients back to the ecosystem.
3. Because sand soil has large spaces between its particles.
4. Because clay soil has small particles.
5. Because it can hold its nutrients.
6. Because large trees do not grow in dry, loose soil in grassland ecosystems.
7. To prevent soil depletion.
8. Due to overgrazing, deforestation, and drought.
9. Because volcanic eruptions make the soil fertile.
10. Because cleaning pollution takes a lot of time and effort.
11. Because it requires a lot of energy and produces a lot of pollution.
12. To save energy and to reduce pollution.

9

1. The soil dries up and loses its nutrients.
2. The soil fertility increases.
3. It becomes a fertile soil.
4. It leads to soil depletion.
5. It leads to climate change.
6. The number of prey will increase.

Concept 3.1 - Model Exam ①

❶ Choose the correct answer:

① A puddle may dry up due to the ………………………… process.

a. condensation b. precipitation c. evaporation d. melting

② Gravity causes the ……………………………….. process.

a. evaporation b. condensation c. precipitation d. transpiration

③ ………………….. is a form of evaporation that takes place in the plant's leaves.

a. Photosynthesis b. precipitation c. transpiration d. Respiration

④ Heat is transferred through the Earth's atmosphere by ……….............…, while the energy from the Sun reaches the Earth's atmosphere through ……….............. .

a. conduction – radiation b. convection – radiation

c. radiation – convection d. radiation – conduction

❷ Put (✓) or (✗):

① The amount of solar radiation that reaches different areas on Earth is equal. ( )

② The water cycle doesn't occur in a dry desert environment. ( )

③ Earth's global wind system contains wind that blows in a constant direction over a long period of time. ( )

④ When precipitation hits the Earth, it may flow across the land as runoff. ( )

❸ Answer the following questions:

(A) Write the scientific term:

It is the continuous movement of water among different reservoirs.

(………………………………)

(B) Give a reason for:

The sun is the main source of energy that drives the water cycle.

………

………

Concept 3.1 - Model Exam ②

❶ Choose the correct answer:

① Convection currents occurring in water cause ………………………, while convection currents occurring in air cause ……………………………… .

a. wind – Volcano eruptions
b. Wind – ocean currents
c. ocean currents – wind
d. falling snow – wind

②The dry air in the wind's cycle forms group of …………………… around the Earth planet.

a. streams
b. puddles
c. forests
d. deserts

③ ……………………… and ……………………… processes release energy.

a. Evaporation – condensation
b. Melting – transpiration
c. Freezing – condensation
d. Transpiration – evaporation

④ ……………………… return(s) water to the air in the form of water vapor.

a. Transpiration
b. Evaporation
c. Condensation
d. (a) and (b)

❷ Put (✓) or (✗):

① The regions near the equator have lowest rate of evaporation. (   )

② The water level in the lake is not affected by any change in temperature. (   )

③ The sun is the most important source of energy that drives the water cycle. (   )

④ Gravity returns ice crystals in clouds to the Earth in the condensation process. (   )

❸ Answer the following questions:

(A) Write the scientific term:

It is the storage location of water on Earth.

(………………………)

(B) Give a reason for:

The water levels in puddles may rise.

………

………

Concept 3.1 - Model Exam ③

❶ (A) Choose the correct answer:

① Which of the following is NOT a result of condensation?

a. Clouds b. Water vapor c. Fog d. Both a and c

② The ………………………… is the main source of energy that drives the water cycle.

a. moon b. gravity c. Sun d. Earth

③ Heat is transferred from the Sun through space by …………………………….

a. conduction b. convection c. radiation d. b and c

④ Water vapor ………………………………… when it rises up in the air and ………………………………… thermal energy.

a. evaporates – gains b. condenses – gains c. evaporates – loses d. condenses – loses

❷ (A) Put (✓) or (✗):

① The climate is not affected by your location on Earth. ( )

② Convection currents occur due to the difference in temperatures and densities of fluids. ( )

③ Water cycle has no starting or ending point. ( )

④ If the Earth stopped rotating, the wind direction would not be affected. ( )

❸ Answer the following questions:

(A) Write the scientific term:

It is the process by which water droplets in clouds fall on the Earth's surface.

(……………………………………)

(B) What happens if:

The amount of the Sun's radiation reaching all parts of the Earth is equal.

……

……

Concept 3.1 - Model Exam ④

❶ Choose the correct answer:

① The snow falling in a polar region represents …………………….. process.

a. condensation b. precipitation c. evaporation d. melting

②......................... processes are the reason that water vapor exists in the air.

a. Transpiration and condensation b. Evaporation and precipitation
c. Precipitation and condensation d. Evaporation and transpiration

③The water in a river traveling down a mountainside and into the sea represents ....

a. Transpiration b. precipitation c. runoff d. Evaporation

④ In .... regions, the rate of evaporation would be the highest.

a. the moderate b. the coolest c. the hottest d. polar

❷ Correct the underlined words:

①Flamingos feed on the algae in the lake's deep water. (   )

②Transpiration is a form of condensation. (   )

③Sun is the basic force that drives the water cycle. (   )

④ Wind may contain water droplets or ice crystals. (   )

❸ Answer the following questions:

(A) Write the scientific term:

It is a way of heat transfer through liquids and gases. (.......................)

(B) What happens if: Precipitation hits Earth.

....

....

Concept 3.1 - Model Exam ⑤

❶ Choose the correct answer:

①Convection currents are created because the .... heats the Earth unevenly.

a. moon b. wind c. desert d. Sun

②The presence of all the following in the air helps in the formation of clouds, except ....

a. pollens b. smoke particles c. dust particles d. rocks

③When the air particles gain energy, they become .... dense and ....

a. more – sink b. less - sink c. more - rise d. less - rise

④ As you go away from the equator, ...

a. sunlight is distributed on less area b. sunlight is distributed on greater area
c. precipitation increases d. the temperature increases

❷ (A) Put (✓) or (✗):

① Deserts are formed because dry cold air descends back to the Earth's surface. (   )

② When ice in glaciers loses energy, it changes into liquid water. (   )

③ When a gas is heated, it expands and becomes denser. (   )

④ If you live in an area near the equator, you may feel hotter as very slanted rays of sun is distributed over a small area. (   )

❸ Answer the following questions: (A) Write the scientific term:

It is the step in which water flows along the Earth's surface into streams or rivers.

(...)

(B) Give a reason: Transpiration process has an important role in the water cycle.

....

....

Concept 3.1 - Model Exam ⑥

❶ Choose the correct answer:

① Among the forms of precipitation are ....

a. rain, hail, and snow
b. the Sun, rain, and snow
c. seas, rivers, and oceans
d. mountains, valleys, and rivers

② In the convection process, heat is transferred from ....

a. high to low
b. wet areas to dry areas
c. cold regions to warm regions
d. warm regions to cold regions

③ When water vapor rises in the atmosphere, it cools and .... forming ....

a. evaporates – clouds
b. condenses – clouds
c. melts – ice
d. freezes – oxygen

④ .... causes the air to rise and form wind.

a. The rotation of Earth
b. The movement of ocean currents
c. The cooling of air molecules
d. The warming of air by the Sun's radiation

Q2: (A) Choose from column (A) what suits it in column (B):

(A)	(B)
1. Gravity	a. affects the wind direction.
2. Earth's rotation	b. is the force that pulls the rain down.
3. Condensation	c. is a form of evaporation that takes place in plants.
4. Transpiration	d. is the opposite process of evaporation.

1. ………………. 2. …………… 3. ……………. 4. …………………

❸ Answer the following questions:

(A) Write the scientific term:

It is the transfer of heat caused by the rising of hotter fluids and the sinking of cooler fluids. (……………………………………)

(B) Give a reason:

Dust particles in the air help in the precipitation process.

……

……

Concept 3.1 - Model Exam ⑦

❶ Choose the correct answer:

① All the following factors can change the state of matter, except …………………

a. the motion of air b. the change in thermal energy

c. the change in temperature d. the gravity force

② Fog forms due to …………………. while snow falling due to ………………………….

a. evaporation - precipitation b. condensation – evaporation

c. precipitation – condensation d. condensation – precipitation

③ The lakes and rocks are examples of …………………………………… .

a. forces b. energies c. reservoirs d. heat transfer

④ When air is warmed by the Sun's radiation, ……………………….. .

a. warm air rises to replace the cooler air

b. cooler air sinks to replace the warmer air

c. warm air sinks to replace the cooler air

d. cooler air rises to replace the warmer air

❷ Complete the following sentence using the words between brackets:

(dry - ocean currents - evaporation - cooled - Clouds – precipitation - wind)

① ……………. may contain water droplets or ice crystals.

② The water levels in puddles rise due to ………….., while they drop due to ……………. .

③ Convection currents occurring in water cause ……………, while convection currents occurring in air cause ……………… .

④ When air is ………., it descends to reach the Earth's surface and becomes …….

❸ Answer the following questions:

(A) Write the scientific term: It is the basic **force** that drives the water cycle.

(………………………)

(B) What happens if: A warm moist air touches a cold glass of water.

………

………





Concept 3.2 - Model Exam ①

❶ Choose the correct answer:

① Warm moist air condenses at high elevations due to ....

a. high temperature b. low temperature
c. high atmospheric pressure d. high density of air

② All the following are used to carry measurement tools high in the atmosphere, except ....

a. satellite b. airplanes c. weather balloons d. barometer

③ Wind is created when ....

a. warm air replaces cold air
b. more dense air replaces less dense air
c. less dense air replaces denser air
d. both air masses are the same temperature

④Extreme precipitation may cause all the following, except ....

a. destroying buildings b. changing an ecosystem
c. improving an ecosystem d. human injuries

⑤ Most weather phenomena occur in .... layer.

a. Mesosphere b. troposphere c. Thermosphere d. Stratosphere

❷ Put (✓) or (✗):

① All parts on Earth's surface receive the same amount of solar energy. (   )

② Meteorologists use complex computer models to predict how different factors will interact and change the conditions in the atmosphere. (   )

③ Difference in temperature and density are patterns that cause changes in weather. (   )

④ A frozen ground can absorb the water when flooding occurs. (   )

❸ Answer the following questions:

(A) Write the scientific term:

It is the horizontal movement of air on Earth's surface.

(................................)

(B) Give a reason for:

On blowing talcum powder over a lighted lamp, the talcum powder rises up.

....

....

Concept 3.2 - Model Exam ②

❶ Choose the correct answer:

① The temperature may reach more than 50 degrees in Aswan in the summer. This reflects the ....

a. humidity   b. atmosphere   c. weather   d. climate

② Putting data on a weather map represents .... in weather prediction.

a. gathering data   b. collecting data
c. analyzing data   d. putting it all together

③ .... pulls the heavy water droplets in clouds downward.

a. Humidity   b. Gravity   c. Wind   d. Sunlight

④ All the following are considered weather disasters, except ....

a. drought   b. flooding   c. sandstorms   d. wind

⑤ When cold air replaces warm air, ...

a. a convection current occurs   b. wind stops
c. wind moves vertically   d. air current moves horizontally

❷ Put (✓) or (✗):

① Technology has no role in the developing of predicting weather conditions. (   )

② Changes in pressure and wind speed can predict changes in the weather. (   )

③ Sandstorms can be several miles long and thousands of feet high. (   )

④ Atmospheric pressure at a mountain's foot is less than that at its top. (   )

❸ Answer the following questions:

(A) What will happen if : Sudden melting of snow and ice over a region...
....

(B) Write the scientific term:

The rising and falling of air due to differences in temperature and density. (   )

Concept 3.2 - Model Exam ③

❶ Choose the correct answer:

① Sandstorms are most common in ....

a. polar regions b. deserts c. rainforests d. green landscapes

② If the temperature at the top of the mountain is 10^{o}C, then the temperature at its bottom might be .... ^{o}C.

a. 10 b. 5 c. 50 d. 20

③ .... is the slowest material that heats up.

a. Sand b. A rock c. Soil d. Water

④ .... is the measure of the amount of water vapor in the air.

a. Humidity b. Temperature c. Wind d. Atmospheric pressure

⑤ The horizontal movement of air along Earth's surface is called ....

a. air currents b. atmosphere c. wind d. air pressure

❷ Put (✓) or (✗):

① Floods may cause the drowning of livestock. (   )

② Weather balloons are designed to carry measurement tools up high in the atmosphere. (   )

③ Weather satellites can predict the possible path of a hurricane. (   )

④ Ecosystems can't recover from flooding. (   )

❸ Answer the following questions:

(A) Write the scientific term:

It is the overflow of water on the land around riverbanks due to the increase in rainfall flowing on the river. (...................................)

(B) Give a reason for:

Air currents differ from wind.

....

....

Concept 3.2 - Model Exam ④

❶ Choose the correct answer:

① The sequence of weather forecast is ....

a. collecting data → putting all together → analyzing the data.
b. analyzing the data → putting all together → collecting data
c. collecting data → analyzing the data → putting all together.
d. putting all together → analyzing the data → collecting data

② Farmers take the advantages of .... energies to power farms in desert.

a. solar and wind b. wind, sound
c. wind and chemical d. solar, sound

③ .... is the main reason of many weather disasters.

a. Global climate change b. Pandemic
c. Ocean currents d. Earth's rotation

④ Temperature is measured by ....

a. thermometer b. barometer c. anemometer d. rain gauge

⑤ .... looks like a solid wall of debris and dust traveling along the horizon.

a. A flood b. A drought c. An earthquake d. A sandstorm

❷ Put (✓) or (✗):

① The paths of both thunderstorms and hurricanes can be tracked by radar.
② A drought means that there is more water available for growing crops.
③ Wind is created due to the equal heating of Earth's surface by the Sun.
④ In desert, the amount of water that evaporates is less than that falls by precipitation.

❸ Answer the following questions:

(A) Write the scientific term:

A device that is used to transport weather forecasting devices into higher altitudes. (..............................)

Give reasons for:

Weather balloons are designed to carry measurement tools high in the atmosphere.

....
....

Concept 3.2 - Model Exam ⑤

❶ Choose the correct answer:

① All the following are from the ways farmers in the desert use to improve the soil, except ………….

a. reusing water b. use wind turbines
c. use high fertility and water crops d. use solar energy

② During a sunny day on beach, …………………..

a. the temperature of both water and land increases by the same rate.
b. the temperature of both water and land decreases by the same rate.
c. the temperature of land increases faster than the temperature of water.
d. the temperature of water increases faster than the temperature of land.

③ Increasing the amount of rain on an area that can't hold the water may cause ………….

a. drought b. floods c. sandstorm d. rain shadow

④ The climate is ………………………….…… .

a. the amount of rain an area receives
b. the state of the atmosphere at a specific place and time
c. the air temperature
d. the average weather condition over an extended period of time

⑤ At the tops of mountains, the air pressure is ……………………….……. the pressure at the foot of the mountains.

a. higher than b. less than c. equal to d. vanishing compared to

❷ Choose from column (A) what suits it in column (B):

(A)	(B)
1. Anemometers (………)	a. are used to power farms in deserts.
2. Drought (………)	b. are used to measure the wind speed.
3. Wind turbines (………)	c. are instruments used to measure the temperature.
4. Thermometers (………)	d. occurs when there is no rain for a long time.

❸ Answer the following questions: (A) Write the scientific term:

It is the tool used by meteorologists to measure atmospheric pressure.

(B)Give reasons for: Sand on the beach is hotter than the sea water during the day.

……

……

Concept 3.2 - Model Exam ⑥

❶ Choose the correct answer:

① As the humidity increases, the amount of condensed water in the air ……………… .

a. increases b. decreases c. doesn't change d. disappears

② A rain shadow is formed on the ……………………………… side of a mountain as a result of ……………………………… precipitation there.

a. wet, more b. dry, less c. wet, less d. dry, more

③ Extreme precipitation may cause all the following, except ……………………………… .

a. destroying buildings b. changing an ecosystem
c. improving an ecosystem d. human injuries

④ A rainfall can be predicted by …………………., while the amount of rainfall can be measured by ……………………… .

a. rain gauge – weather radar b. weather radar – anemometer
b. anemometer – rain gauge d. weather radar – rain gauge

⑤ All the following from the hazards of flood, except …………………. .

a. breaking buildings b. drowning of animals
c. distrusting economy d. Improving ecosystem

❷ Put (✓) or (✗):

① Atmospheric pressure doesn't change by increasing the altitude above sea level. ( )

② Small and unexpected changes in wind or moisture in the air cannot affect next week's weather. ( )

③ Farmers take advantage of sun conditions and wind in desert biome by using solar panels and wind turbines to power farms. ( )

④ Sandstorms can cause reduce of visibility that accompanied by high wind. ( )

❸ Answer the following questions:

(A) Write the scientific term:

They are scientists who use different tools to study and forecast weather.
(……………………………………….)

(B) What happens to:

1. The reading of a hiker's barometer when climbing a mountain.

……………………………………………………………………………………………………
……………………………………………………………………………………………………

2. The temperature of the sea water at night.

……………………………………………………………………………………………………
……………………………………………………………………………………………………

Concept 3.2 - Model Exam ⑦

❶ Choose the correct answer:

① .... is the main reason for the occurrence of weather phenomena.

a. The moon b. The Sun c. Wind d. Snow

②All the following are used to carry measurement tools high in the atmosphere, except ....

a. satellites b. airplanes

c. weather balloons d. barometer

③Sandstorms occur when strong wind blows up ....

a. snow and dust b. sand and water vapor c. sand and dust d. dust and hail

④Which statement is correct?

a. Water heats up faster than sand.

b. Water needs less energy than sand to heat up.

c. Sand heats up slower than water.

d. Sand needs less energy than water to heat up.

⑤ Putting data on a weather map represents .... for weather prediction.

a. gathering data b. collecting data

c. analyzing data d. putting it all together

❷ Put (✓) or (✗):

① Farmers irrigate by reusing water to overcome the little rain in the desert.

② Rain gauge is an instrument that used to measure the amount of rain.

③ Falling of ice crystals is an example of precipitation process.

④ The little precipitation may cause drought.

❸ Answer the following questions:

(A) Give a reason for:

Sandstorms can be hazardous to motorists or drive a car.

....

....

(B) Write the scientific term:

The science that studies and predicts the weather conditions.

(.................................)

(C) Correct the underlined words:

① <u>Air mass</u> is created by the unequal heating of Earth's surface.

② <u>Coastal</u> often have two sides which are wet side and dry side.

Concept 3.2 - Model Exam ⑧

❶ Choose the correct answer:

① Cold air is………………………………. than warm air, so cold air ………………

a. more dense – sinks b. less dense – rises

c. more dense – rises d. less dense – sinks

② The extended heat waves may cause ………………………………………. .

a. Floods b. droughts c. volcanoes d. earthquakes

③ ……………………………… pulls heavy water droplets in clouds downward.

a. Humidity b. Gravity c. Wind d. Sunlight

④ ……………………………… is the slowest material that heats up.

a. Sand b. A rock c. Soil d. Water

⑤ The amount of water vapor found in air is called ………………………… .

a. humidity b. evaporation c. condensation d. cloud

❷ Put (✓) or (✗):

① Meteorologists can be completely sure of future weather conditions. (   )

② By increasing the altitudes, atmospheric pressure and air density increases. (   )

③ Sandstorms can be several miles long and thousands of feet high. (   )

④ Mapping data helps meteorologist to predict the weather conditions. (   )

❸ Answer the following questions: A. Write the scientific term:

A device that is used to transport weather forecasting devices into higher altitudes. (…………………………….)

B. Give a reason:

① Hot air rises up, while cold air moves down.

……

……

② Weather radar is important for meteorologists.

……

……

C. What happens when: Dust builds up on solar panels after a sandstorm.

……

……

Concept 3.2 - Model Exam ⑨

❶ Choose the correct answer:

① Which statement is NOT true about sandstorms?

a. They reduce visibility. b. They don't affect people health.

c. They affect water quality. d. They are accompanied by high winds.

② The density of cold air is .... that of hot humid air.

a. more than b. equal to c. less than d. similar to

③ When air particles are heated, all the following occur, except ....

a. air particles expand b. air becomes more denser

c. air becomes less dense d. air rises

④ Sandstorms may occur in an area that has experienced ....

a. prolonged drought b. short-term drought

c. flood d. melting of ice

⑤ .... are scientists who study and predict the weather.

a. Cell biologists b. Meteorologists

c. Zoologists d. Ecologists

❷ Put (✓) or (✗):

1. At the bottom of a mountain, the density decreases due to the presence of heavy gases. (   )
2. Barometer measures how fast the wind is blowing. (   )
3. Desert is characterized by hot and rainy climate. (   )
4. When water droplets in clouds become larger and denser, they evaporate. (   )
5. During climbing a mountain, air pressure increases while air density decreases when we go down. (   )

❸ Answer the following questions:

(A) Write the scientific term:

It is the amount of force that air (the weight of air) exerts on a certain area.

(..)

(B) Mention one use of:

1. Satellites...

2. Weather maps...

(C) What happens to:

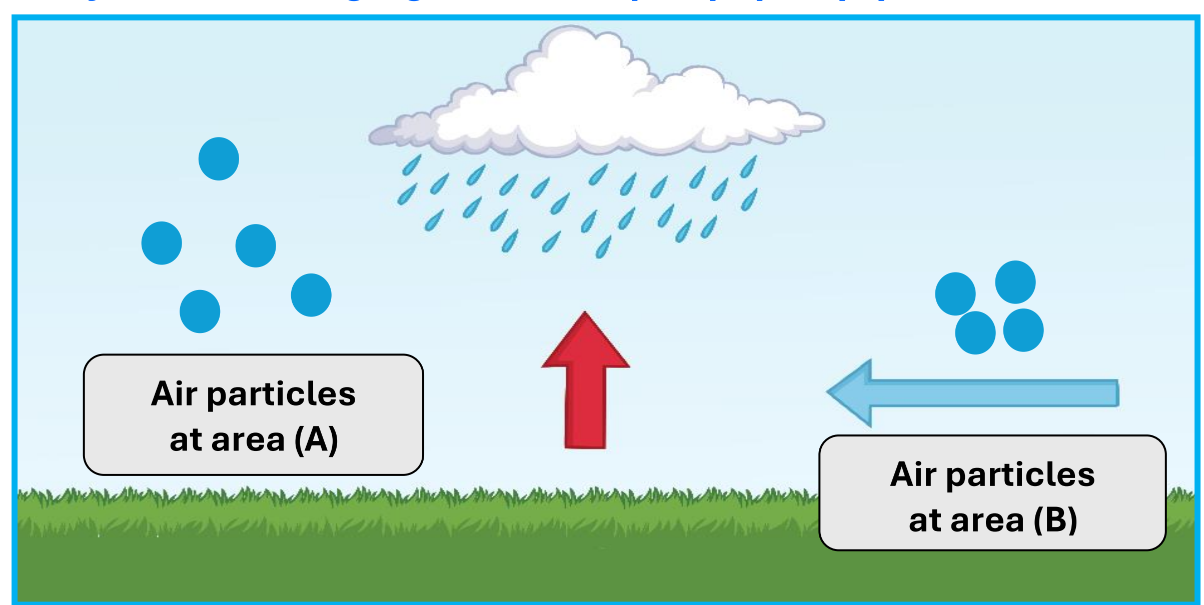
An irrigation canal when a sandstorm fills up it with dust. ....

Concept 3.2 - Model Exam ⑩

❶ Correct the underlined words:

① <u>Anemometer</u> is a device that measures the amount of rain in a certain area.
② The force of air exerts on a certain area is known as <u>precipitation.</u>
③ The amount of water vapor in the atmosphere represents <u>atmospheric pressure.</u>
④ <u>Thermometer</u> is used to measure the wind speed.

❷ Study the following figures, then put (✓) or (✗):



① The movement of the air particles at area (B) to area (A) represents air current. (   )

② The movement of the air particles at area (A) represents wind. (   )

③ Air particles at area (B) has high atmospheric pressure than that at area (A). (   )

④ Air particles at area (A) have low density while air particles at area (B) have high density. (   )

⑤ Convection current represents vertical movement of air particles caused by difference temperature and density. (   )

❸ Answer the following questions:

What happens when: We move down the mountain according to the air density....

....

Give a reason: Floods have some advantages.

....

....

Concept 4.1 - Model Exam ①

❶ Choose the correct answer:

① The ………………………… is affected directly by an environmental factor.

a. rabbit's fur color b. kitten's eye color
c. amount of light a tree gets d. tree's height

② ………………………………… may be found in the same habitat of lizards.

a. Emperor penguin b. Arctic fox
c. Poison dart frog d. Dorcas gazelle

③ A healthy environment is characterized by the presence of …………………………… .

a. polluted water b. no sanitation
c. widespread diseases d. health care

④ Desert ecosystem is characterized by the presence of all the following, except ……… .

a. temporary ponds b. little rainfall
c. moderate climate d. little groundwater

⑤ The growth of a child will be affected by ……………………………………… .

a. the lifestyle choices b. the genetic factors
c. the environmental factors d. all the previous answers

❷ Put (✓) or (✗):

① The genetic factor controls the traits passed down from the offspring to the parents. ( )
② The pointy ears in cats are inherited traits. ( )
③ Water availability in the environment promotes an animal's growth and survival. ( )
④ Falcons and zebras are birds that migrate to Egypt in winter. ( )
⑤ You need to drink only fresh orange juice to be healthy. ( )

❸ Answer the following questions:

(A) Write the scientific term: It is a type of gazelle that lives in the deserts and semideserts of Egypt. (…………………………………)

(B) What happens if:

Sphynx and Birman cats have the same genetic factors of hair length.

………
………

Model Exam ②

❶ Choose the correct answer:

① The ability of Dorcas Gazelles to go months without drinking is the …………………… factor(s).

a. Environmental b. genetic c. human d. both of (a) and (b)

② Desert plants usually have …………………… to keep animals away.

a. leaves b. fruits c. colorful flowers d. prickles

③ Both Birman cats and Sphynx cats are similar in …………………… .

a. their hairless body b. being from Felis catus
c. being wild cats d. their hair length

④ All the following lifestyles make our bodies healthy, except ………………… .

a. a proper nutrition b. smoking
c. avoiding drinking soda d. exercising

(B) Write the scientific term:

It is species to which pet cats belong. (…………………………)

❷ (A) Put (✓) or (✗):

① Organisms that can adapt to environmental factors pass on their traits to the next generation. ( )

② The scarcity of resources in an environment helps living organisms survive. ( )

③ When there is rainfall in a desert, plants sprout slowly, reaching the flowering stage. ( )

④ Smoking affects our health positively. ( )

(B) Correct the underlined word:

Birds' migration is an example of **<u>physical</u>** adaptation. (…………………………)

❸ (A) Answer the following questions:

Complete the following sentences using the given words between the brackets: **(the environmental - long and silky – physical - genes - type of leaves)**

① The offspring of a Birman cat has ………………………… hair on its body.

② A plant has …………………… that determine its roots structure and …………………… .

③ The dryness of a plant in dry seasons is due to ………………………… factor.

④ The ………………………… adaptation would help some birds to survive their migration journey more than others.

(B) Give a reason for: You should avoid eating a lot of chips.

……

……

Concept 4.1 - Model Exam ③

❶ Choose the correct answer:

① All the following are examples of physical adaptation, except ……………………

a. Thick fur b. migration
c. white fur d. thorns on a plant's stem

② ……………………… are not adapted to withstand low temperature.

a. Caribou b. Arctic foxes
c. African penguins d. Wolves

③ The growth of a child will be affected by ……………………… .

a. the lifestyle choices b. the genetic factors
c. the environmental factors d. all the previous answers

④ …………… is/are NOT from the challenges that face(s) birds' migration journey.

a. Predators b. Limited food resources
c. Extreme weather d. Moderate weather

⑤ Both Birman cat and Sphynx cat are similar in ……………………… .

a. their hairless body b. being from Felis catus
c. their hair length d. being have the same genetic factors

❷ Put (✓) or (✗):

① The length of your fingers and your nose shape are determined by the same genetic factor. ( )

② The availability of light and water influences the behavior of plants carrying out photosynthesis and the growth of trees and shrubs in an ecosystem. ( )

③ Adaptations occur in response to the availability or limitation of abiotic factors. ( )

④ Our diet is the only factor that affects our growth. ( )

❸ Complete the sentences using the words between the brackets:

(growth – dew – vegetation – an environmental)

① Large parts of Egypt's Western Desert have little ……………………… .

② The lifestyle choices affect our ………………………………… and development.

③ The dryness of plants in August is due to .... factor.
④The short roots of some desert plants can catch drops of ....

❹ Answer the following: (A) Give reasons for:

You are never going to see a Sphynx cat that has long hair like a Birman one.

....

....

(B) Write the scientific term:

An area that contains biotic and abiotic factors that interact with each other. (...)

Model Exam ④

❶ Choose the correct answer:

① .... is one of an organism's basic needs for survival.

a. Availability of light and water
b. Limited access to food and water
c. Unsuitable homelands for breeding
d. (b) and (c)

② The difference between a Sphynx and a Birman cat is that ....

a. A Sphynx has long hair while a Birman is hairless.
b. A Birman has long hair while a Sphynx is hairless.
c. Neither Birman nor Sphynx have hair.
d. Both Birman and Sphynx have hair.

③ Offspring (New plants and animals) receive .... from the cells of their parents.

a. Organs b. genetic information
c. inherited traits d. no correct answer

④The .... is the most likely physical trait to be passed on to the offspring of desert butterflies.

a. green-colored wings b. red-colored wings
c. sandy-colored wings d. blue-colored wings

⑤The body of .... is covered with tough-sandy colored scales.

a. a lizard
b. an African penguin
c. an emperor penguin
d. an Arctic fox

❷ Choose from column (A) what suits it in column (B):

(A)	(B)
1. Emperor penguins	a. are coated with tough-sandy scales.
2. Lacking sanitation	b. have blubbers covered with dense feathers.
3. Habitat loss	c. leads to the spread of diseases.
4. Lizards	d. causes a rabbit to inherit brown spots from its mother.
5. Genetic factor	d. is an environmental factor that affects animals' migration journey.

1. .... 2. .... 3. .... 4. .... 5. ....

❸ Answer the following questions:

A. Write the scientific term:

① It is a type of adaptation in which are related to an organism's structure to help it to survive in its habitat. (.......................................)

B. Give a reason for the following:

① Some plants which lives in desert have long extended roots under Earth's surface and thick stems.

....

....



Concept 4.1 - Model Exam ⑤

❶ Choose the correct answer:

① Hereditary influences human growth and development by ....
a. Determining lifestyle choices
b. Controlling environmental factors
c. Passing on genes that determine physical traits
d. None of the above

② All the following characteristics help in growth and survival of desert plants, except ....
a. wide leaves b. thorns c. shallow roots d. thick stems

③ Environmental factors that can impact human growth and development negatively include all of the following, EXCEPT ....
a. Lack of access to clean water b. Unsafe work conditions
c. Access to health care d. Lack of sanitation

④ The reason(s) behind birds migration is/are that ....
a. To find better food sources b. To escape predators
c. To breed in warmer climates d. All previous answers

❷ Put True or False:

① Growing a plant towards light is a structural adaptation.
② Adaptations occur in response to the abundance or limitation of abiotic factors.
③ African penguin has a circle of skin without feathers surrounding each of its eyes to keep its body cool.
④ An arctic is an example of small ecosystem that contains caribou that feeds on grasses.

Give a reason:

Emperor penguin has thick blubber and dense feathers.
....
....

What will happen if: A plant is exposed to too much light.
....
....

Concept 4.1 - Model Exam ⑥

❶ True or False:

① Both intensity and amount of the light are affected the plant growth. ( )

② Most animals that live in polar regions have colorful poison skin. ( )

③ The size of habitat and water are examples of environmental that affects increasing the number of different animals species in the same area. ( )

④ During reproduction, the nucleus of cell helps to pass on genes (cellular instructions) from each parent to offspring that are responsible for determining physical traits. ( )

❷ Complete the following sentences using the given words between the brackets: (abiotic - genetic factor habitat loss - Falcons - hereditary traits - biotic - Red Sea)

① The .... are genetically passed on from the parents to the offspring.

② In Egypt, Nile River and .... are important stopovers for eagles and .... flocks in winter.

③ An ecosystem contains .... and .... components.

④ The lifestyle choices and .... affect our growth heath and behavior development.

⑤ Finding resting sites during birds' migration journey may be hard due to ....

❸ A. Write the scientific term:

① It is a type of adaptation in which are related to an organism's structure to help it to survive in its habitat. (.......................................)

② They factors that control what traits are transmitted genetically from the parents to the offspring. (.......................................)

③ They carry genetic information and responsible for determining inherited traits that passed from parents to offspring. (.......................................)

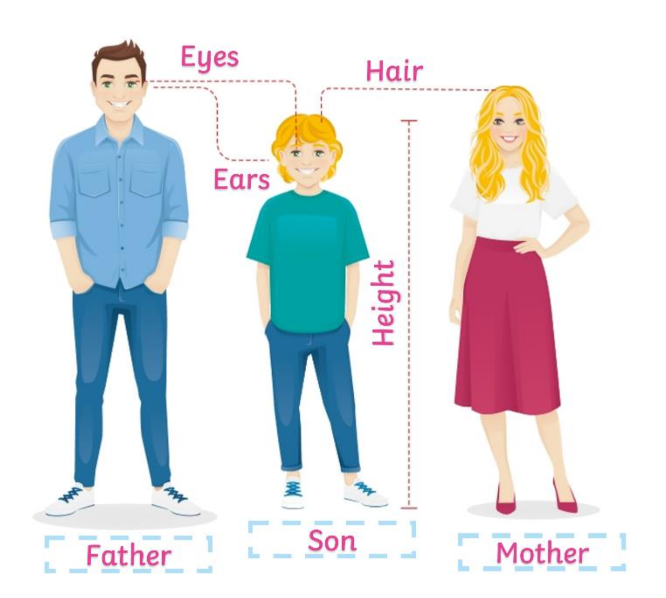
B. What will happen if:

African penguin has feathers surround its eyes.

....

....

❹ A. Study the following figures, then put (✓) or (X)



① Cellular instructions (Genes) are found in the nucleus of a cell and are responsible for determining inherited traits. (   )

② Offspring receive genes from their mother only. (   )

③ Ears lobe, eye color and how you tall are examples of inherited traits. (   )

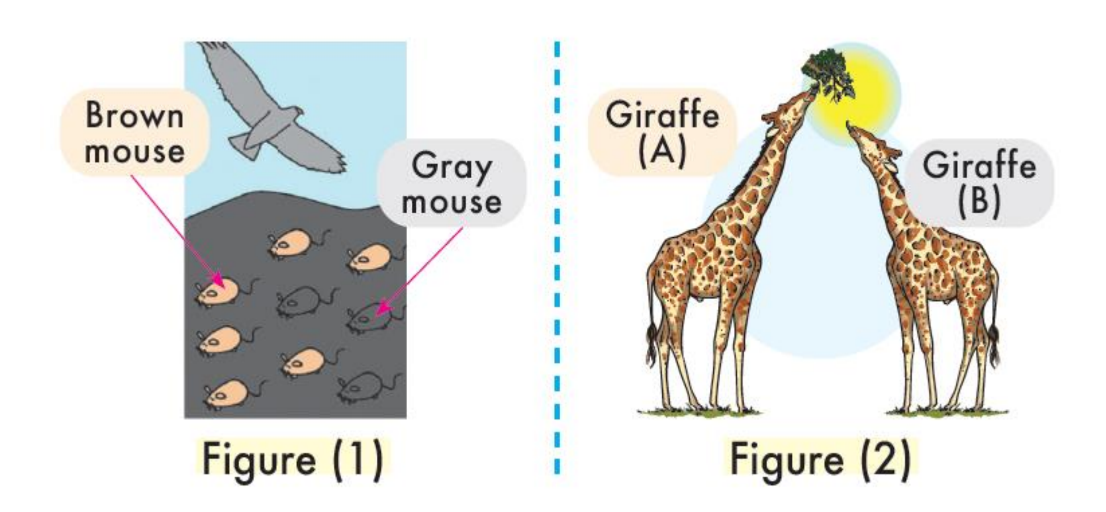
④ Every parent passes down an exact copy of all their genes to their offspring. (   )

⑤ A son can look completely different from his parents even though he shares some of their genes. (   )





C. **Study the following figures, then put (✓) or (✗):**



① In figure (1) , brown mice will perish (die). ( )

② In figure (1), the offspring of next generations of mice will have brown fur. ( )

③ In figure (2), the giraffe (A) will survive and reproduce. ( )

④ In figure (2), the offspring of next generations will have the short-neck trait. ( )





Concept 4.1 - Model Exam ⑦

❶ Choose the correct answer from the following:

❶ Migratory birds such as steppe eagles have ……….. adaptations that help them to migrate millions of miles. (Physical – behavioral)

❷ Arctic region is an example of …………… ecosystem. (Small – large)

❸ Thick stems and leaves are important in some desert plants to (store water – make herbivores away)

❹ Genes (Cellular instructions) are transmitted from the ……….. of parents to offspring. (cell nucleus – cell wall)

❺ The shape of leaves growing on a plant is an example of ………… adaptation. (physical - behavioral)

❻ ………… is an environmental factor that affects increasing number of different animals species in an ecosystem. (The availability of light – The size of habitat)

❷ True or False:

1. The height of plants is determined by genetic factors such as the grass plants are usually shorter than the tall flowering plants in a forest. (   )
2. In Arctic ecosystems, caribou hunt wolves that feed on grasses. (   )
3. If a living organism is adapted in an extreme ecosystem, its offspring becomes stronger as the parent pass on the genes that determine traits that help them to survive. (   )
4. The amount of grass that a rabbit eats is affected by an environmental factor. (   )

❸ Complete the following sentences using the given words between the brackets:

(seeds – Light - Antarctic – dew – biotic – Water - desert – abiotic)

1. Lizards live in ………………, while emperor penguin live in …………… .
2. Living in herds in some animals like sheep is a ……………… adaptation.
3. Desert plants produce long-lived ……………………… when there is rainfall.
5. ……………… and ………….. are the primary components in an ecosystem.
6. Short roots of some desert plants can catch drops of …………………… .

Give a reason:

Birds migrate from one place to another seasonally.

……………………………………………………………………………………………

……………………………………………………………………………………………

Concept 4.1 - Model Exam ⑧

❶ Choose the correct answer from the following:

① Water, sunlight, and air are all examples of a type of …………………………… factors in the ecosystem.

a. biotic b. living c. non-essential d. abiotic

② What adaptation does not protect a plant from being eaten by herbivores?

a. The leaves of a plant with small, sharp spines

b. The leaves of the plant which have a very bitter taste.

c. The poisonous plant leaves.

d. The plant leaves which store large amounts of water.

③ The polar bear ability to live in extremely cold regions is considered ……………………………… .

a. behavioral adaptation b. reproduction ways

c. structural adaptation d. environmental changes

④ Adaptation occurs in response to ……………

a. Abundance of resources only. b. Limitation of resources only.

c. Both (a) and (b) d. No correct answer

❷ Complete the following sentences:

1. Cat breeds can vary in ………….. despite being belong to the same species, Felis catus.
2. Plants in the desert have adapted to extreme sun exposure and little rainfall through ………….. .
3. Lifestyle choices such as ………….. can impact health and development positively.
4. A ……………… inherits its hairless body from its parents, while a Birman offspring inherits its ……………. from its parents.

❸ Write the scientific term:

1. It is one of problems that found in unhealthy environments which causes the spread of diseases. (……………………………………)
2. It is a factor that affects the plant growth and can cause damage its parts or burning it. (……………………………………)

❹ Give reasons for:

Dorcas gazelle can't be seen easily by predators.

………

………



Concept 4.1 - Model Exam ⑨

❶ Choose the correct answer from the following:

① All the following are examples of the ways of desert plants adaptation, except ……….

a. They have prickles to make herbivores away.
b. They have thick stem or leaves to store water.
c. They have thick fur to adapt in cold habitat.
d. they have short roots to catch any drops of dew.

② …………….. play a role in determining health and development in people.

Environmental factors b. Lifestyle choices
c. Genetic factors d. All the previous answers

③ …………………… inherited from parents determine various traits in offspring.

a. Genes b. Organs c. Environmental factors d. Tissues

④ Plants grow toward light is considered as …………………………… .

a. structural adaptation b. reproduction ways
c. behavioral adaptation d. genetic factors

⑤ Abiotic factors affect …………………..

a. the growth of living organisms b. the way of adaptation
c. the color of eyes of living organisms d. (a) and (b)

❷ Correct the underlined words:

1. The instructions for survival in challenging conditions are built into plant's **leaves**.
2. **Environmental factors** such as diet and exercise affect health and behavior development.
3. A Sphynx is a **hairy** cat.
4. Sphynx and Birman cats have the **same** genetic factors for hair length.
5. **Organs** inherited from parents determine various physical traits such as earlobes, finger length, and height of living organisms.

❸ Answer the following:

Mention two factors affect the plant to carry out photosynthesis process:
1. ………………………… 2. ……………………………
Mention two examples of behavior adaptation:
1. ………………………… 2. ……………………………
Mention two inherited traits determined by genetic factors:
1.………………………… 2. ……………………………

Concept 4.1 - Model Exam ⑩

❶ Complete the following sentences using words between brackets:

① .... is an example of inherited trait
(The shape of leaves – the intensity of light)

② Scientists found that plants in desert have adapted to the environmental pressure such as ....
(Cold climate , too much rain – Extreme sun exposure and very little rain)

③............ has ability to hide among rocks because of sand-scales that covers its body. (Poison dart frog – Lizard)

④ Size of habitat and the availability of light are examples of ....
(Genetic factors – Environmental factors)

⑤ When resources are scarce animals must depends on their .... to adapt in extreme conditions. (Physical traits – lifestyle choices)

⑥................ bear fruits when the length of day is shorter than the night.
(Sunflower – Chrysanthemum)

❷ Complete the following sentences:

1. ……………………… and challenges can lead to adaptation in plant species over time, influencing their survival in extreme conditions.
2. People in some places such as unhealthy environment lack the basic needs like …………….. and …………
3. Dorcas gazelle has …………………… as structural adaptation to survive in the desert habitat While falcons ……………….. as behavioral adaptation to breed and find food.
4. A rabbit has brown spot on its fur just like its parent is affected by ……………… factors while the number of different species in an ecosystem is affected by …………….. factors .

❸ Put true or False:

① A Sphynx's offspring may not end up having the same hair and skin as its parents. (   )

②The length of the stem of Chrysanthemum flowers is from the genetic factors that affect its growth. (   )

③ Limited access to water and food is one of reasons that cause migratory birds return to homeland environment. (   )

④ Elephants living in a herd is an example of structural adaptation. (   )

⑤ Plant growth is affected by the intensity and amount (duration) of light. (   )

Concept 4.2 - Exam 1

❶ A. Choose the correct answer:

① Soil is formed as a result of the ………… and ………… processes.

a. weathering – photosynthesis
b. erosion - respiration
c. weathering - erosion
d. condensation – erosion

② If the air temperatures in an ecosystem increases, the soil will …………

a. become wet and lose its nutrients.
b. become dry and retain its nutrients.
c. become dry and lose its nutrients.
d. become wet and retain its nutrients.

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③ Drainage of water is ………………… in the sand soil while …………. in silt soil.

a. fast – slow
b. medium - fast
c. slow – medium
d. fast – medium

④ All the following are human activities that cause habitat destruction, except ……………………… .

a. turning prairies into factories
b. deforestation
c. ripping up land for mining
d. floods

B: Give a reason: Volcanic eruptions benefit the soil.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

❷ A. True or False

① Soil is considered home to fungi, worms, and bacteria. (   )

② Nutrients released from the decomposition of dead plants return to soil only. (   )

③ Habitat can be destroyed by human activities only. (   )

④ The overuse of pesticides and chemical fertilizers cause soil depletion. (   )

B. Give a reason: Brick and concrete industry damage the environment.

……………………………………………………………………………………………………

❸ (A) Write the scientific term:

1. It is the process by which rocks are broken down into small pieces. (...................................)
2. They are ingredients in soil is formed from the remains of dead organisms including plants and animals.
(...................................)
3. It is an ecosystem that contains dry sand soil and large and fast carnivores such as lions and cheetahs.
(...................................)
4. They are new species that come into an area whether naturally or brought by humans. (...................................)

(B) Give a reason: **Decomposers play a crucial role in balancing environment.**..

....

Concept 4.2 - Exam 2

❶ (A) Choose the correct answer:

① **........... soil has a gray color, while .... soil has a dark brown color.**

a. Clay – sand b. Sand – silt

b. c. Silt – clay d. Clay - silt

② **All the following from characteristics of humus except, it is .... matter.**

a. a dark-colored b. an organic matter

c. an inorganic d. rich-in nutrient

③ **Controlling air pollution from cars .... water pollution.**

a. increases b. doesn't affect c. boosts d. reduces

④ **Decomposers recycle all the following back to the soil, except ....**

a. oxygen b. carbon c. rocks d. nitrogen

(B) Write the scientific term:

It is a process by which the land becomes infertile due to overgrazing, extreme deforestation, or drought. (.........................)

❷ A) Choose from column (A) what suits it in column (B)

(A)	(B)
1. Clay soil	a. They are types of insects that live in bog ecosystem that is characterized by cool temperature.
2. Mosquitos	b. They are one of natural processes that has positive effect to make soil fertile.
3. Habitat	c. It is a type of soil that is characterized by black color and the size of its particles are small.
4. Volcanic eruptions	d. It is a place where living organisms live and provide them with resources such as water, air and shelter and space.

1. ………………. 2. …………… 3. ………….. 4. …………

❸ (A) Correct underlined words:

1. Floods and diseases from **human activities** cause habitat destruction.

2. Topsoil is used as sustainable materials for building.

3. Water, rocks, air and minerals represent **organic** ingredients of soil.

4. Cheetahs and lions are examples of fast and large **herbivores** animals

(B) What happens if: **We add chemical fertilizers to tomato crops.**

………………………………………………………………………………………………………

………………………………………………………………………………………………………



Concept 4.2 - **Exam 3**

1 Choose the correct answer:

① In soil formation, small pieces of rock are carried away and mixed with other particles during the ……………………… process.

a. weathering b. erosion c. evaporation d. condensation

② The ……………………… weather may cause soil drought.

a. extreme hot b. rainy c. humid d. hot and rainy

③ When large predators disappear from an area, prey's number ……… .

a. decreases b. increases c. doesn't change d. stays constant

④ ………… are considered from the solid inorganic components of the soil.

a. Plant's roots b. Worms c. Minerals d. Fungi

B: What happens if: We add chemical fertilizers to tomato yields.

………

………

---

2 (A) Put (✓) or (✗):

1. Manure is a chemical fertilizer that can be used to add nutrients to the soil. ( )
2. Clay soil is more compacted than sand soil. ( )
3. Any rock particle in the soil is made up of only one mineral. ( )
4. Brick is made from a chemically altered soil. ( )

(B) Write the scientific term:

It is a dark organic, rich-nutrient matter formed from the decomposition of dead organisms. (……………………………………)



❸ A) Choose from column (A) what suits it in column (B):

(A)	(B)
1. The removal of vegetation	a. is One of methods is used to classify and identify on the type of soil.
2. Natural fertilizers	b. varies in size and color and is responsible for retaining water and filter it.
3. The size of soil particles	c. is one of reasons that increases soil erosion
4. Soil	d. is one way of restorative practices that maintain soil health.

B)Correct the underlined words:

Lion and leopards are examples of **herbivores** that feed on gazelles.

Concept 4.2 - Exam 4

❶ Question One: A: Choose the correct answer:

① Soils with large spaces between the particles are characterized by the ability to seep in water .... and retain it ....

a . slowly - well
b. quickly – well
c. quickly - poorly
d. slowly – poorly

② What is the method through which we reduce the occurrence of erosion due to water?

a. Weed removal
b. Adding clay to the soil
c. Creating more ramps
d. Digging trenches

③ All the following are the advantages of using subsoil as a building material, except that ....

a. it saves energy
b. it reduces pollution
c. it is eco-friendly
d. it causes pollution

④ **Overgrazing and deforestation can ....**

a. make the soil infertile
b. cause desertification
c. increase the soil fertility
d. a and b

B: Write the scientific term:

They are non-native species that are introduced to a habitat either naturally or by humans. (.........................)

❷ (A) True or False

1. Frogs and mosquitos are from the most common animals that live in savannas. (   )
2. Tomatoes yield benefit from regular and moderate watering. (   )
3. Using chemical fertilizers one of poor agricultural practices that cause an increased risk of desertification. (   )
4. Without a healthy topsoil, it is easier to grow crops. (   )

(B) What happens if:

Humans keep natural vegetation and apply fertilizers correctly.

....

....

③ Complete the following sentences using the given words: (organic matter- Humid areas – medium - Crop residue - clay-rich soil)

1. Nutrients that have been depleted can be added back into the soil using ......
2. The soil that contains a huge amount of water can be found in .... while .... can be found in hot and dry areas.
3. The soil that retains .... amount of water becomes more fertile because it keeps its ....

Concept 4.2 - **Exam 5**

1 Choose the correct answer:

① A habitat provides the living organisms with ………… .

a. water b. food c. shelter d. all the previous

② Lionfish is an example of a/an ……………… species in the Red Sea.

a. native b. extinct c. invasive d. endangered

③ All the following are considered as inorganic components of soil, except ………… .

a. air b. water c. minerals d. humus

④ All of the following are restorative practices that keep soil healthy, except ……….

a. Using crops residues b. Using chemical fertilizers
c. Using natural fertilizers d. Crop diversification

B: Give a reason:

Water drains from silt soil faster than from clay soil.

……………………………………………………………………………

……………………………………………………………………………

2 True or False:

1. Climate is the only factor that is responsible for soil variety. ( )
2. The ratio of inorganic material is always greater than that of organic material in any soil type. ( )
3. The size of particles of sand is smaller than the size of particles of clay and silt. ( )
4. Increasing the slope of the land causes more erosion. ( )
5. When predators disappear, prey populations can grow unchecked and deplete resources, contributing to habitat destruction. ( )

3 (A) Complete the sentences using the words between the brackets: (wetland - temperature - invasive – erosion - Topsoil – grassland – subsoil -predators)

1. Savannah is an example of ……………… ecosystem while bog is an example of ………….. ecosystem.
2. …………… is used for agriculture, while ………………… is used as a sustainable building material.
3. Overpopulation can occur in a variety of ways, such as increase…………… species and decrease the number of …………. .
4. Soil protects the Earth from ………. and regulates its ………

Concept 4.2 - Exam 6

1 Choose the correct answer:

① All of the following are the consequences of habitat destruction, except ………

a. Producing much carbon dioxide gas.
b. Increasing the rate of climate change.
c. increasing the availability of resources.
d. Affecting population respond and animals' behavior.

② Soil in bog ecosystems is characterized by ………..

a. they are dry sand soil
b. they are wet clay soil.
c. they are dry silt soil
d. (a) and (c)

③ Rocks are made up of a variety of …………………

a. similar minerals
b. different minerals
c. different worms
d. organic matter

④ …………. is an example of how human activities can lead to habitat destruction.

a. A new species coming into an area naturally
b. Lands ripped up for building roads and railroads
c. Volcanic eruptions leading to make the soil more fertile
d. Both (a) and (c).

② True or False:

1. Soil erosion is a natural process, but it can be reduced through practices by planting vegetation. (   )
2. Both cheetahs and lions live in bog ecosystems that is characterized by cool temperature. (   )
3. Using soil fences and sedimentation ponds reduce air pollution. (   )
4. Climate change caused by human activities can change behavior of plants and animals to adapt or risk extinction. (   )

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③ (A) Complete the sentences using the words between the brackets: **(Bacteria – Leopards – Frogs - Lionfish)**

1. …………………… caused the loss of 79% of native young fish in the Red Sea.
2. …………………… live in bogs ecosystem.
3. …………………… are considered from decomposers.
4. …………………… are from the carnivores in savannah grasslands.

(B) Write the scientific term:

It is the uppermost loose layer of the Earth's surface. (…………………………)

Concept 4.2 - Exam 7

① Choose the correct answer:

① All the following procedures can reduce water pollution, except …………… .

a. setting enforced laws
b. treatment of sewage
c. overusing chemical fertilizers
d. the correct disposal of trash

② The herbivores which live in savannah are ………… .

a. lions
b. leopards
c. gazelles
d. frog

③All the following are the main factors that cause differences in soil, except ……………………….

a. Type of rocks from which soil is formed.
b. The prevailing climate
c. Types of living organisms living in soil
d. Human activities such as planting different crops.

④ The type of soil is widely around the world used in the process of creating building materials is …………….

a. Topsoil b. rocky c. Subsoil d. Sand

(B) What happens if:

The clay soil in bog ecosystems drain water quickly.

……………………………………………………………………………

…………………………………………………………………………

2 (A) True or False:

1. All types of soil retain the same amount of water. ( )
2. Effectively enforced laws plays a main role in reducing water pollution. ( )
3. Decomposers decay dead organisms into components rich in nutrients materials called humus that help plant to grow. ( )
4. Deserts, forests, streams, oceans, and grasslands are all examples of habitats. ( )

(B) What happens to: Animals' population when their natural habitat is destroyed. ……………………………………………

……………………………………………………………………………

3 Answer the following:

① Mention three types of soil.

A. ………………… B. ……………. C. ………………..

② Mention three inorganic ingredients of soil.

A. ………………… B. ……………. C. ………………..

③Mention Three methods to reduce pollution:

A. ………………… B. ……………. C. ………………..

Concept 4.2 - Exam 8

Question One: (A) Choose the correct answer:

① The ……………… is made at a higher temperature than that needed for making ……………… .

a. brick - cement b. cement – brick
c. food – brick d. cement - topsoil

② **Which statement about lionfish is true?**

a. They are invasive species. b. They harm the native population.
c. They have no natural predators. d. All the previous answers

③ ………………………… is/are the building blocks of rocks.

a. Minerals b. Humus c. Water d. Air

④ **Soil becomes infertile due to ……………….**

a. Using Crop residue like straw. b. Extreme deforestation
c. Planting diverse crops d. Adding nutrients

(B) What happens if: Humans keep natural vegetation and apply fertilizers correctly.

…………………………………………………………………………
………………………………………………………………………..

Question Two (A) True or False:

1. Brick is made from a chemically altered soil. (   )
2. The ability of soil to retain water depends on the size of the organic matter. (   )
3. Manure is a chemical fertilizer that can be used to add nutrients to depleted soil. (   )
4. Human overpopulation cause resources shortage for humans and other organisms. (   )

(B) Correct underlined words:

Savannah grassland soil drains water **slower** than a bog soil.

Question Three: (A) Write the scientific term:

1. It is a natural substance in the soil that is turned into a glue-like substance when chemicals are added.

(…………………………….)

2. It is a place where living organisms live. (…………………………….)

3. They are living organisms that recycle nutrients from dead organisms back to the ecosystem. (…………………………….)

4. They are non-living things found in soil, including water, air, rocks, and minerals. (…………………………….)

(B) Give a reason: Different soils differ in their textures.

………………………………………………………………………

………………………………………………………………………

Concept 4.2 - Exam 9

Question One: (A) Choose the correct answer:

① …………. is /are one of restorative practices that focuses on planting different types of crops and rotate them with crops that keep the soil fertility.

a. Desertification b. Soil depletion

c. Crop diversification d. Chemical fertilizers

② **All of the following contribute to preventing water pollution, except …………**

a. Using correctly applying fertilizers.

b. Throwing wastes in waterways

c. Keeping natural vegetation.

d. Using soil fences and soil sediment ponds

③ ……………… soil has a gray color, while ………… soil has a dark brown color.

a. Clay - sand b. Sand - silt

c. Silt - clay d. Clay – silt

④ **Climate change caused by humans' impact habitats ………**

a. Improving ecosystems. b. leading to extreme earthquakes

c. Increasing the soil fertile. d. Changing living organisms' behavior.

Question Two: (A) Put True or False:

① The soil provides the plants with nutrients only. ( )

② Treatment of sewage and industrial water is not necessary. ( )

③ Humans can change or accelerate habitat destruction, which contributes to climate change. ( )

④ Increasing the speed of the water flowing on a soil decreases soil erosion. ( )

(B) What happens if: The percentage of carbon dioxide gas increases due to human activities.

…………………………………………………………………………………

…………………………………………………………………………………

…………………………………………………………………………………

Question Three: (A) Write the scientific term:

1. They are the spaces found between the particles of soil. (……………………………)
2. It is an example of an ecosystem that its soil characterized by being wet most of the time. (……………………………)
3. It is the loose layer that covers Earth's crust. (……………………………)
4. It is an example of invasive species that found in some areas of the Red Sea and responsible for using up resources and killing native species. (……………………………)

(B) Complete the following sentences:

1. To bind the subsoil together, scientists add ……… that turn clay into a ……….. substance.

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Concept 4.2 - Exam 10

Question One: (A) Choose the correct answer:

① **All the following are dynamic natural changes that cause habitat destruction, except ……………**

a. earthquakes b. hurricanes
c. deforestation d. floods

② **Increasing the temperature forms a …………. soil, while increasing precipitation forms a ………… soil.**

a. Waterlogged – wet b. clay – dry
c. dry – waterlogged d. waterlogged – clay

③ **Soil protects the Earth from ………………. .**

a. erosion b. weathering
c. rain d. insects

④ **Which of the following is a method of reducing erosion due to both wind and water?**

a. Removal of vegetation b. Building a dam
c. Planting trees d. Removal of weeds

(B) What happens if: Decomposers are absent from an ecosystem.……………………………………………………………

………………………………………………………………………………

Question Two: (A) Correct underlined words:

1. Bacteria and **frogs** are considered from decomposers.
2. **Subsoil** is used for agriculture.
3. Clay soil is wet because it drains water **quickly**.
4. **Decomposer** provides plants with water and air.

(B) The amount of organic matter in soil can affect

1. …………………… 2. ………………………..

Question Three: (A) True or False:

1. The conversion of forests to cities makes the soil healthier. (   )

2. Overpopulation means rapid increases the number of certain species of living organisms in a habitat. (   )
3. Forest fires and volcanic eruptions have cycles in nature that have positive impacts on habitat. (   )
4. Many living organisms can live in waterlogged soil due to presence availability of water and air. (   )
5. Human activities such as removing forest and waste disposal in landfills contribute to climate changes and cause accelerate habitat destruction. (   )

(B) Give a reason: Not all soil types have the same texture.

....

....





Give the reason.

1- **Drying up of the large lake in turkey in the summer season**
   Due to the increase of evaporation of the lake water
2- **Formation of fog in the early morning**
   Due to condensation of water vapor that is found in the air
3- **Changing of water from one state to another**
   Due to gaining or losing of thermal energy
4- **Moving down of glaciers from the top of a mountain to its foot**
   Due to the effect of gravity on glaciers
5- **Changing of some amount of water in water bodies into water vapor**
   Due to evaporation process as a result of gaining thermal energy
6- **About 10% of water vapor in air comes from plants**
   Due to transpiration process which happens by plants
7- **Formation of clouds in the sky**
   Due to condensation of water vapor into water droplets that attach to particles of dust or smoke in the air
8- **Hot air moves upward above cold air**
   Due to convention where hot water has less density and rises up while cold air has more density and falls down
9- **The weather in the are near the equator is hot**
   Because the sun rays fall perpendicular on Earth's surface giving high effect of heat





10- **The effect of heat is low in the area at the north and south of the equator**

Because sun rays fall semi inclined on Earth's surface of these areas, so the weather is warm

11- **On adding warm water to cold water without shaking, the warm water stays above the cold water without mixing**

Due to convection as warm water has less density than cold water so warm water stays above cold water

12- **The formation of wind is determined by the amount of solar radiation received by the Earth**

Because warm air rises up when it is heated by solar radiation, and it is replaced by cooler air from nearby areas

13- **Desert farming faces many difficulties**

Because the desert's climate is hot, and the amount of water is small

14- **Sometimes people prefer to live in desert land instead of cities**

Due to the fast population growth in cities

15- **Hot air moves up while cold air moves down**

Because hot air has low density while cold air has high density

16- **At noon, we may not be able to stand barefoot on the sand of a beach in summer, but we can swim in the sea water**

Because sand is heated up faster than water



17- **When air is heated, it expands**

Because the molecules of air move away from each other

18- **Extreme weather became more stronger in many places around the world**

Due to global climate change

19- **Floods have some benefits**

Because some ecosystems depend on floods such as ecosystems along the Nile

20- **Sandstorms have harmful effects on human health**

Because they harm the human eyes and respiratory system

21- **Small Dorcas gazelle is similar to its parents**

Because they get some genetic factors from their parents

22- **falcons and eagles migrate to Egypt in winter**

because Egypt in winter has a moderate climate condition

23- **birds migrate from one place to another place**

to search for the best conditions that help them reproduce

24- **African penguin has a circle of skin that does not have any feather around each of its eyes**

To help its body cool fast in hot climate

25- **Most of desert plants have short extended roots near the Earth's surface**

To absorb any available water and to catch the smallest drops of dew

26- **Some plants in deserts produce seeds that can live for a long time**

Because in deserts there are shortage of rainfall for a long time

27- **Poison dart frog has colorful poisonous skin**

To protect itself from predators

28- **Lizard body is covered with sandy colored scales**

To hide among rocks in desert

29- **Some plants which live in desert environment have long roots**

To get the deep groundwater

30- **A Birman kitten has long and silky hair**

Because it inherits this trait from its parents

31- **Sphynx cats does not have long hair**

Because it does not have the genetic factor for long hair

32- **Your lifestyle choices affect your health**

Because it depends on your behavior which may be good habits or bad habits

33- **Decomposers have an important role in the formation of soil**

Because they recycle the remains of dead animal and plants into chemical nutrients in the soil

34- **There are many types of soil**

Due to different amounts of ingredients that form them

35- **Soil is very important for plants**

Because they provide the plants with the basic needs such as air, water and nutrients





36- **Water can flow very fast through sand soil**

Because it has large amount of pores between its particles

37- **The soil that retains medium amount of water is more fertile**

Because it keeps the organic materials that helps the plant to grow

38- **Clay soil can retain more amount of water and air**

Because it has small amount of pore spaces between its particles

39- **The soil in a bog ecosystem is wet most of the time**

Because it is rich in clay particles that retain much water

40- **Large trees cannot grow in savanna grassland ecosystem**

Because the soil is sand soil which is dry and drains water quickly

41- **The increase in the inclination of Earth's surface causes the erosion of the soil**

Because inclination increases the speed of moving water causing more erosion of the soil

42- **Scientists and farmers should use crop remains like straw and stem in the soil**

To add nutrients to the soil so the soil is restored

43- **Desertification process increases recently**

Due to deforestation, drought and overgrazing

44- **Soil scientists and engineers hope to stop using traditional bricks and concrete in building houses**

Because they need large amount of energy to be manufactured and produce a lot of amount of pollution



45- **We should keep green areas and reduce the amount of fertilizers**
To reduce water pollution

What happens to/if?

1- **The level of water in a lake when the rate of evaporation increases**
The level of water will decrease

2- **The snow when sunlight falls on it**
The snow will melt and change into liquid water

3- **Water of seas and oceans gains big amount of thermal energy**
Water will change into water vapor

4- **You cover some leaves in a plant with a plastic bag then put it in the direct sunlight**
Water droplets will form inside the bag

5- **Moist air touches a cold bottle of water**
Water vapor condenses on the surface of the bottle

6- **Water vapor in air condenses in the sky**
Clouds are formed in the sky

7- **Water droplets in the clouds become very heavy**
Water droplets fall in the form of rain

8- **Weather if the sun rays fall very inclined on an areas**
The weather in this area becomes very cold

9- **The density of air if the cloud air is warmed by the effect of solar energy**
The density of the air will decrease

10- **Air temperature if there is no wind on Earth**
The regions around the equator become extremely hot and the poles will completely freeze

11- **The movement of air when solar radiation heats up the air in an area**
The air will move upward

12- **The atmosphere pressure, as we move up toward the top of a mountain**
The atmosphere pressure decreases

13- **Air density as we move down toward the bottom of the mountain**
Air density will increase

14- **The temperature of water inside a beaker if we put it under a lighted lamp for few minutes**
The temperature of water will increase

15- **The temperature of a desert sand at night**
The temperature of a desert sand will decrease

16- **We boil water in a pot on the stove (concerning the movement of hot water and cold water)**
Hot water moves up and cold water falls down

17- **Buildings when they are subjected to strong floods**
They may be damaged by moving or breaking them

18- **Solar panels when dust accumulates on them**
Solar panels stop generating energy

19- **If the environmental conditions change in the homeland in which some migratory birds live**
They will migrate to another suitable habitat



20- **To the living organisms in an ecosystem, if water and light are not available**

Living organisms cannot survive and will die

21- **To the plants in an ecosystem, if they receive too intense light**

Plant parts may be damaged, dried or burned

22- **To two similar plants, if they are exposed to the same intensity and duration of light**

The two plants will grow with same rate

23- **If the genetic factor of hairless body trait is transferred from sphynx cats' parents to their offspring**

The trait of hairless body appears on the offspring

24- **If the inherited traits are transferred from desert plants to another through generations**

The desert plants are more adapted to survive in extreme desert conditions

25- **The soil if it does not contain any decomposer organisms**

The soil will lose the chemical nutrients that are found in dead plants and animals and the soil will not be fertile

26- **The soil if the temperature in the environment increases**

The soil will be dry and will not be fertile

27- **The soil if it has large amount of pores spaces between its particles**

It allows water to flow fast through it





28- **The soil that holds medium amount of water**
the soil keeps its organic materials, so it becomes more fertile

29- **The soil when there is much water in a wet region**
the soil becomes waterlogged soil and contains very little amount of air, and this doesn't help roots of plants to grow in it

30- **The soil when fertile agricultural lands are converted into factories or pastures**
soil depletion may happen

31- **The soil when farmers increase the planted areas**
the fertility of the soil will increase, and the soil can be restored

32- **The habitat when the number of predators decreases**
the number of preys increases greatly, and this leads to the lack of resources in this habitat, so it causes habitat destruction

33- **The sea water if industrial water is thrown into the sea without treatment**
the sea water will be polluted